COAIRE

SCROLL

OILLESS SCROLL AIR COMPRESSORS

MAINTENANCE MANUAL AND PARTS LIST

CSOF-M3PL/H12
CSOF-M3PL/H22
CSOF-M3PL/H32
CSOF-M3PL/H42

CSOF-M5PL/H22
CSOF-M5PL/H32
CSOF-M5PL/H42

CSOF-S8PL/H22
CSOF-S8PL/H32
CSOF-S8PL/H42

CSOF-S10PL/H22
CSOF-S10PL/H32
CSOF-S10PL/H42

January, 2013
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For proper and safe use of the compressor, please follow all instructions and safety precautions as identified in this manual, along with general safety regulations and practices.

STATEMENT OF WARRANTY TERMS & CONDITIONS

General Provisions:

a) Coaire warrants our air compressors and scroll systems (henceforth called "products") to be free from material defects and workmanship under proper use, operating conditions, installation, and application based on the terms and conditions set forth below. Coaire offers no other warranty, whether expressed or implied, including any warranty of merchantability or fitness for a particular purpose.
b) Any air compressor, part or material found to be defective will be repaired, replaced or refunded at the sellers option free of charge, provided that Coaire is notified with the stated warranty period.
c) All claims shall be made in writing using our ***warranty claim report*** located within each service manual.
d) All claims must have the ***start-up report sheet*** included. The start-up report sheet is located within each service manual.
e) All returns of allegedly defective equipment must have prior written authorization. Said authorization shall be obtained through our service department. Any compressors, parts, or materials must be returned freight prepaid to the manufacturers factory within (30) days of the return authorization date. Any shipment returned to the factory collect will be refused.
f) If an item is found to be warrantable, the repaired or replacement item will be returned normal ground freight, prepaid. Expedited return freight costs are the responsibility of the requestor.
g) Any replacement part or material is warranted to the extent of the remaining warranty period

Standard Period of Warranty:

h) Coaire warrants our system(s) for a period of (15) months from shipment, (12) months from the documented start-up, or 5,000 hours of use, whichever occurs first. During such period, Coaire will be liable for all product or material defects and will assume the costs of repair or replacement so long as the product(s) are located within the continental United States or Canada. In addition, the product(s) must be easily accessible by service personnel for removal.
i) In addition to item "g" above, Coaire warrants the air compressor air end (compressor only), parts only (no labor) for a period of (27) months from shipment, (24) months from the documented start-up, or 7,500 hours of use, whichever occurs first.
j) Coaire product(s) located outside of the continental United States or Canada shall include a parts only warranty for a period of (15) months from shipment, (12) months from the documented start-up, or 5,000 hours of use, whichever occurs first.

Exclusions – Coaire shall have no warranty obligation for:

k) Products not installed in accordance with our written instructions and specifications
l) Operated in an unsuitable environment, in excess of stated product parameters, modified in any way, or used in an improper manner
m) That have not been properly maintained per Coaire's written instructions
n) Use of corrosive materials or insoluble lubricants
o) Normal wear and tear items are not included under this warranty
p) Any OEM (original equipment manufacturer) component that may be used within our products will carry the original manufacturer's warranty
q) Product is properly stored prior to installation
r) Product not installed by a competent, qualified installer
s) Product which may have been damaged during shipment

Liability Limitation:

t) Coaire shall not be liable for any damages (incidental, consequential, punitive, et al.) that may arise from the use of our product. Coaire's liability in all events, is limited to and shall not exceed, the original purchase price.

Suitability of the Product:

u) Jurisdictions has various codes, Coaire makes no claim as to the suitability for all jurisdictions. It is the buyer's responsibility to ensure the product, installation, and use comply with local jurisdictions.

Identification plate:

v) Coaire products have identification plates on the air compressors as well as on the enclosures. These data plates show the primary information for the product. This data should always be referred to when calling the manufacturer or distributor. The removal or alteration of the identification plate(s) shall immediately void all warranty.

Who to contact for warranty claims:

Web: www.coaire.com
Phone: (562) 496-3935
Fax: (562) 463-4928

8750 Pioneer Blvd., Santa Fe Springs, CA 90670

All freight damage claims should be filed within 15 working days and should be directed to the carrier.

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2.0 Safety and Warning

2-1 General

1) The air compressor shall only be operated by a person who has been trained in a safe operation.
2) Please read and be familiar with the user's manual and the safety instructions before using the air compressor.
3) The scroll air compressor alone cannot be used for a respiratory system, food and medical equipment under any circumstance.
4) Do not leave inflammables and explosives near the air compressor.
5) Make sure to use only the genuine Coaire parts. Other types of replacement may cause a serious failure.
6) The equipment shall safely be operated in compliance with all safety requirements and regulations.

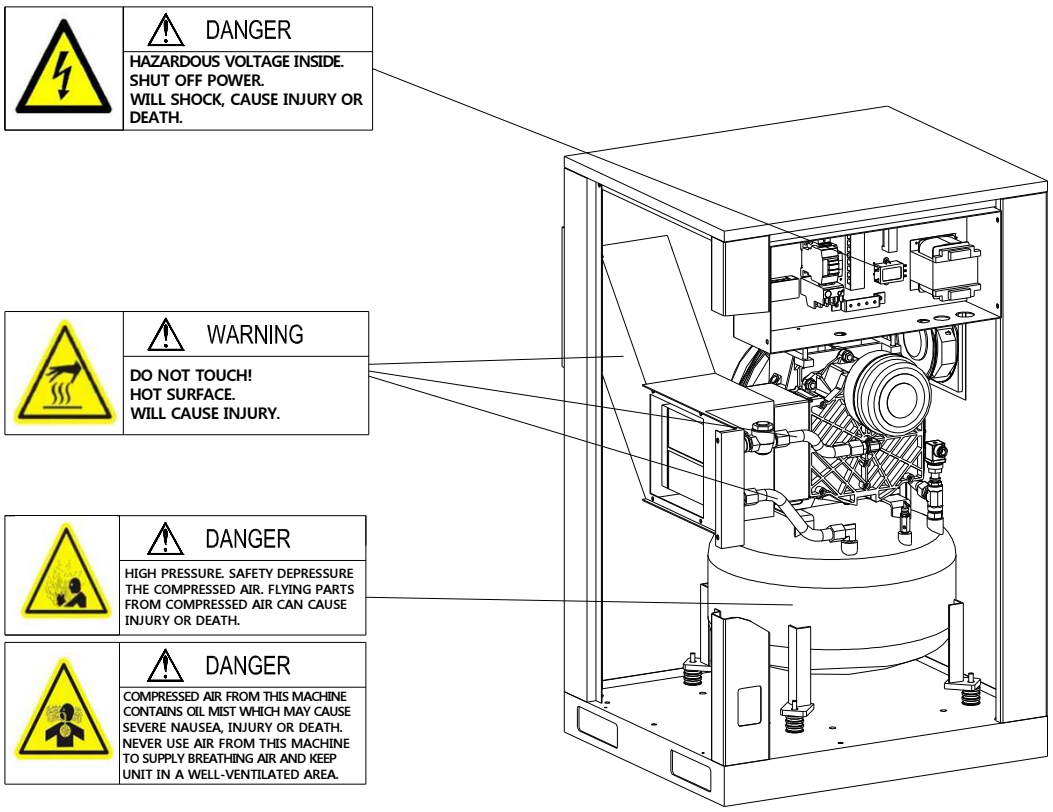
※ The user assumes full responsibility for any problem associated with the non-compliance with the instructions in the user's manual.

2-2 Safety Caution

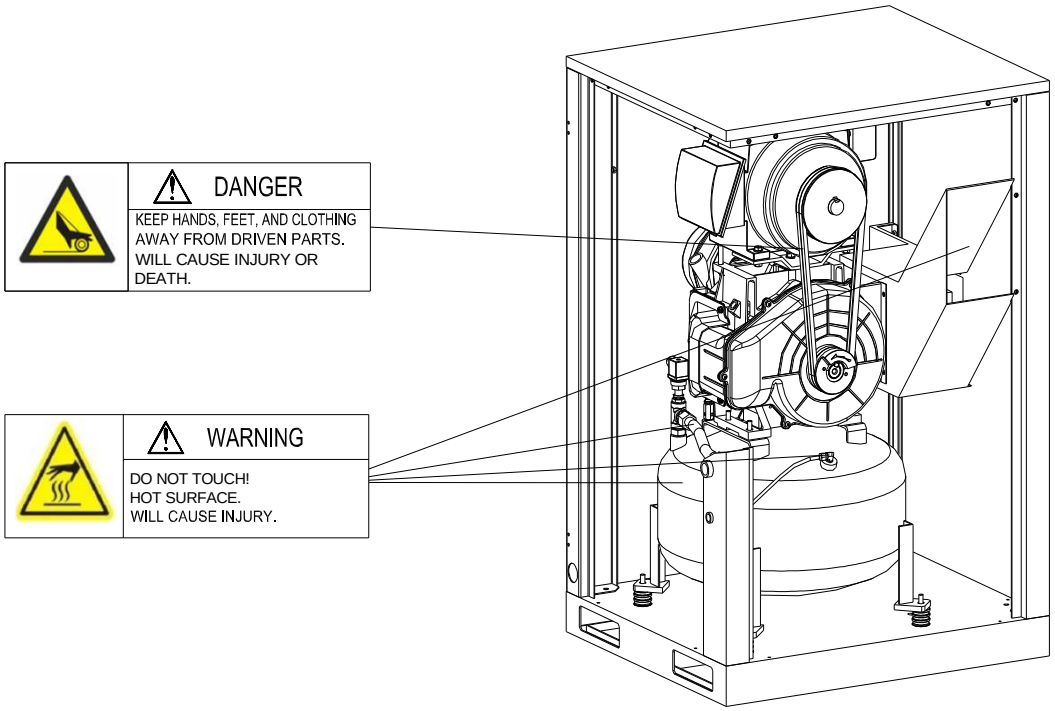
CAUTION	Caution is used to indicate the presence of a hazard which will or can cause minor personal injury or property damage if the warning is ignored.
WARNING	Warning is used to indicate the presence of a hazard which can cause severe personal injury, death, or substantial property damage if the warning is ignored.
DANGER	Danger is used to indicate the presence of a hazard which will cause severe personal injury, death, or substantial property damage if the warning is ignored.
	Hazardous voltage. Can cause severe injury or death. Only use factory supplied for incoming power. See Operators/Instruction manual.
	Moving parts. Can cause severe injury. Do not operate with covers removed. Service only with machine blocked to prevent turn over.
	High pressure air. Can cause severe injury or death. Relieve pressure before removing filter plugs/caps, fitting or covers.
	Please install the product in areas free of explosives (acetylene, propane gas, etc) or flammable substances. In case of operating the product in flammable environment, fire or explosion could be caused.
	Hot surface. Can cause severe injury. Do not touch. Allow to cool before servicing.

2-3 Safety and Warnings

2-3-1 CSOF-M3PL(H) , CSOF-M5PL(H)

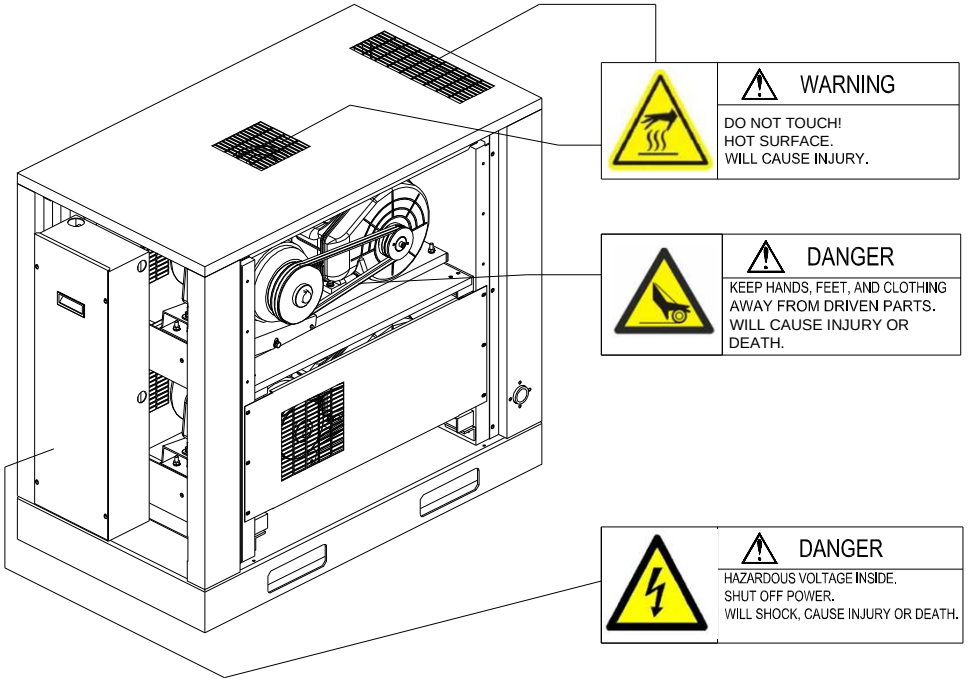

DANGER
HAZARDOUS VOLTAGE INSIDE.
SHUT OFF POWER.
WILL SHOCK, CAUSE INJURY OR DEATH.
WARNING
DO NOT TOUCH!
HOT SURFACE.
WILL CAUSE INJURY.
DANGER
HIGH PRESSURE. SAFETY DEPRESSURE THE COMPRESSED AIR. FLYING PARTS FROM COMPRESSED AIR CAN CAUSE INJURY OR DEATH.
DANGER
COMPRESSED AIR FROM THIS MACHINE CONTAINS OIL MIST WHICH MAY CAUSE SEVERE NAUSEA, INJURY OR DEATH. NEVER USE AIR FROM THIS MACHINE TO SUPPLY BREATHING AIR AND KEEP UNIT IN A WELL-VENTILATED AREA.

[Fig. 2-1] Front Side

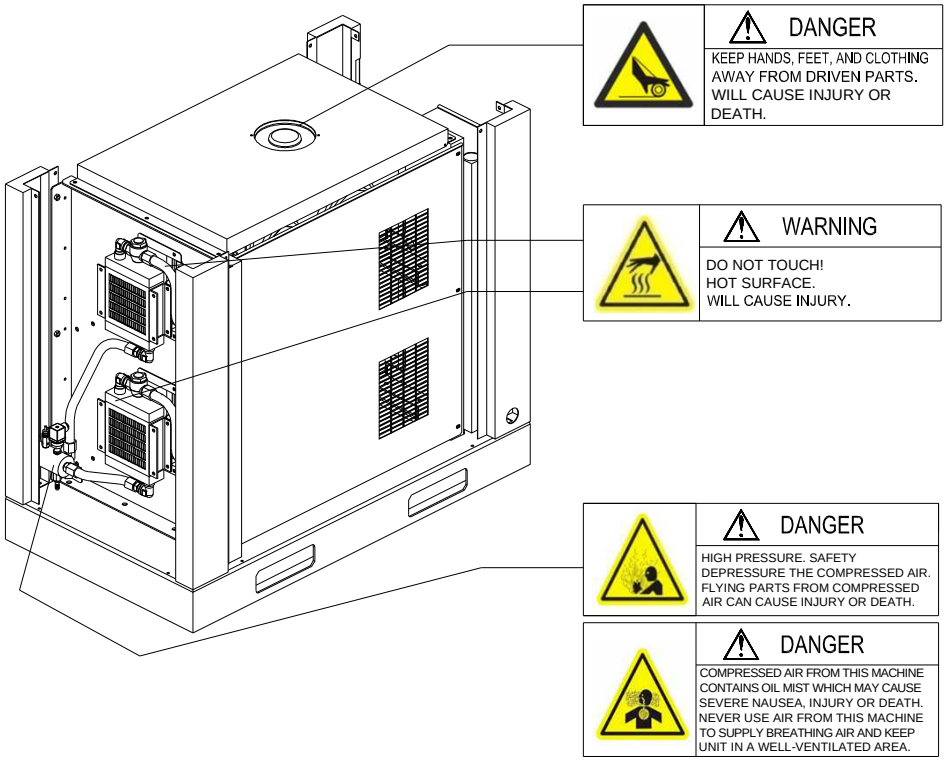

DANGER
KEEP HANDS, FEET, AND CLOTHING AWAY FROM DRIVEN PARTS. WILL CAUSE INJURY OR DEATH.
WARNING
DO NOT TOUCH!
HOT SURFACE.
WILL CAUSE INJURY.

[Fig. 2-2] Rear Side

2-3-2 CSOF-S8PL(H) , CSOF-S10PL(H)



[Fig. 2-3 Front Side



[Fig. 2-4] Rear Side

3.0 General

3-1 Specification

Model			CSOF-M3PL(H)	CSOF-M5PL(H)	CSOF-S8PL(H)	CSOF-S10PL(H)
UNIT	Type		Single Stage Oil Free Scroll Air Compressor			
	Air Delivery (cfm)	115 psi	8.5	14.1	22.6	28.3
		140 psi	7.2	12	19.2	24
	Driving Method	Belt	3V-360x2EA	3V-380x2EA	3V-380x2EA 3V-405x2EA	3V-405x4EA
	High temp. stop (℉)		176			
MOTOR	Output (kW/HP)		2.2/3	3.7/5	2.2/3 x 1SET 3.7/5 x 1SET	3.7/5 x 2SET
	Voltage (V)		208-230, 460			
	Frequency (Hz)		60			
	Poles		4			
	Starting Method		DIRECT ON LINE			
GENERAL	Air Outlet (Inch)		1/2"		1"	
	Receiver Tank (gal)		10		Over 16 (Option)	Over 21 (Option)
	Cooling Type		Air Cooled			
	Service air temp. (℉)		Intake air temperature +45			
	Ambient temp. (℉)		Max. 104			
	Noise Level [dB(A)]		49±5	50±5	52±5	53±5
DIMENSION	Length (Inch)		27.5"		25.6"	
	Width (Inch)		29.1"		45.7"	
	Height (Inch)		42.1"		51.2"	
	Weight (Lbs)		275	330	536	587

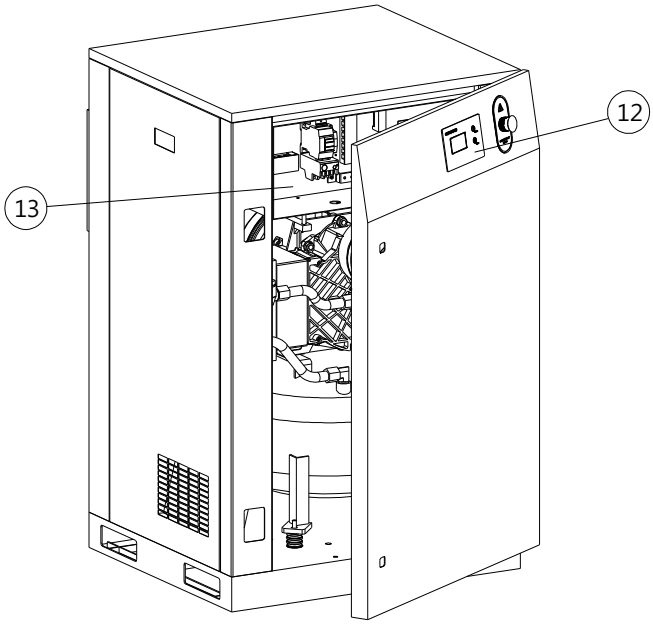
※ Note.
1. Noise level is the measurement from acoustic room.
2. The size is the size of the external design of the package. Protruding areas such as discharge ball valve have been excluded in the measurement.

3-2 Major Component

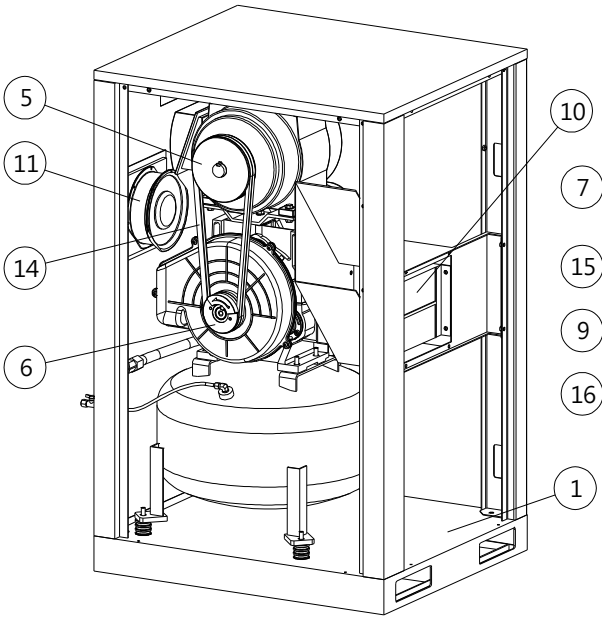
3-2-1 CSOF-M3PL(H), CSOF-M5PL(H)

#. DESCRIPTION

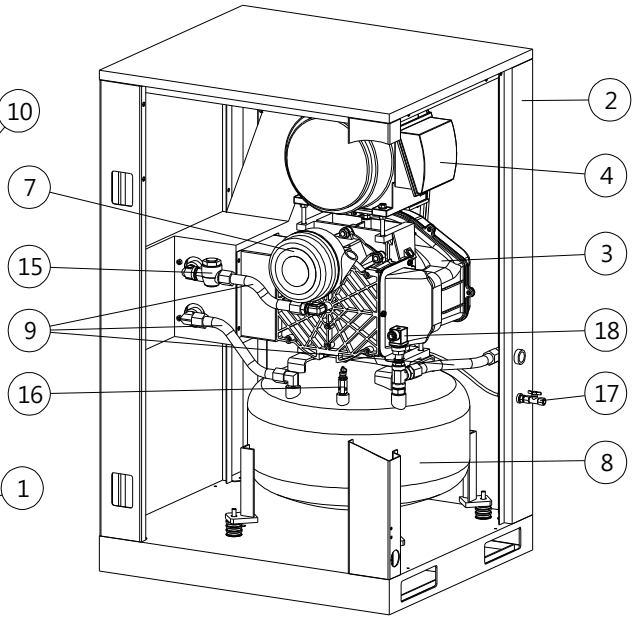
1. COMMON BASE
2. COVER & FRAME
3. AIREND
4. MOTOR
5. MOTOR PULLEY
6. AIREND PULLEY
7. SUCTION FILTER
8. AIR RECEIVER TANK
9. AIR DELIVERY PIPE
10. AIR COOLER
11. COOLING FAN
12. CONTROLLER
13. CONTROL BOX
14. V-BELT
15. CHECK VALVE
16. SAFETY VALVE
17. DRAIN VALVE
18. PRESSURE TRANSMITTER



[Fig.3-1] Outline View



[Fig.3-2] Front View

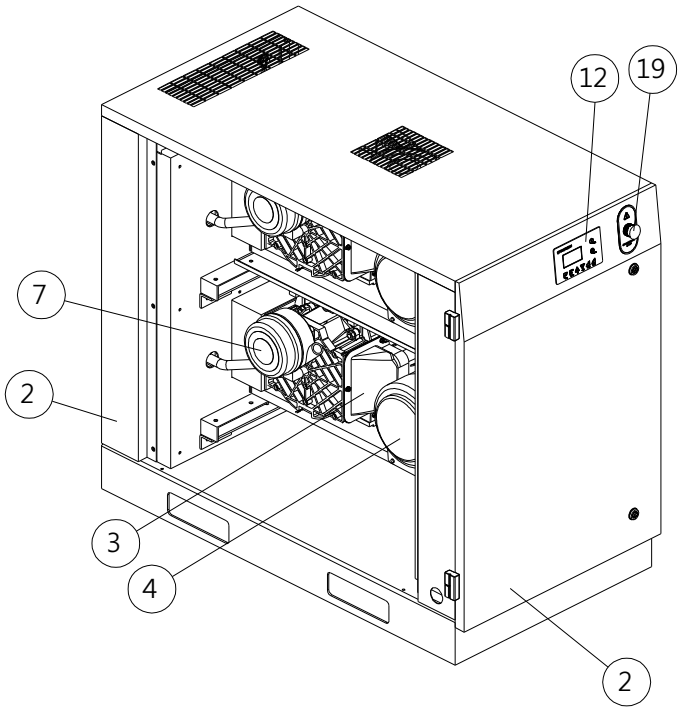


[Fig.3-3] Rear View

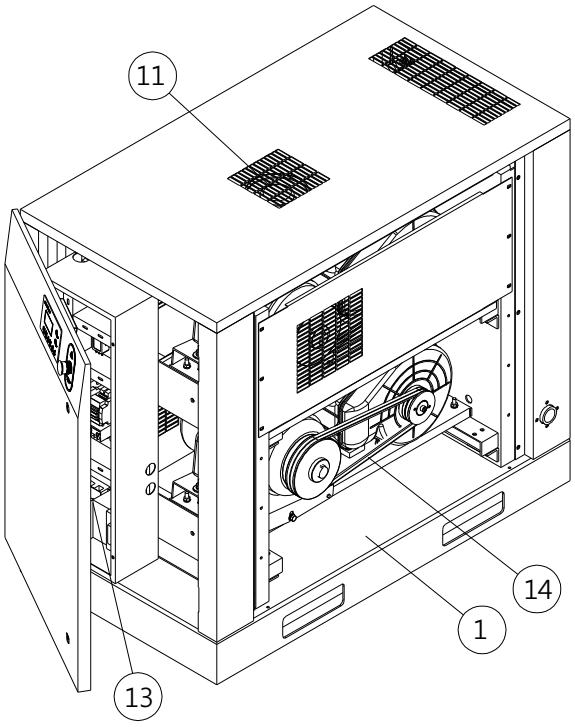
3-2-2 CSOF-S8PL(H), CSOF-S10PL(H)

#. DESCRIPTION

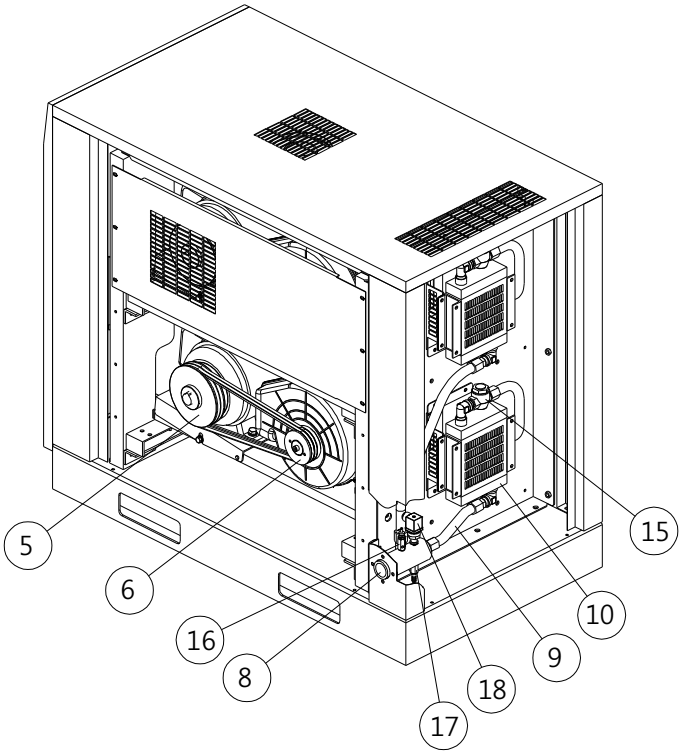
1. COMMON BASE
2. COVER & FRAME
3. AIREND
4. MOTOR
5. MOTOR PULLEY
6. AIREND PULLEY
7. SUCTION FILTER
8. AIR DELIVERY SOCKET
9. AIR DELIVERY PIPE
10. AIR COOLER
11. COOLING FAN
12. CONTROLLER
13. CONTROL BOX
14. V-BELT
15. CHECK VALVE
16. SAFETY VALVE
17. DRAIN VALVE
18. PRESSURE TRANSMITTER



[Fig.3-4] Left View



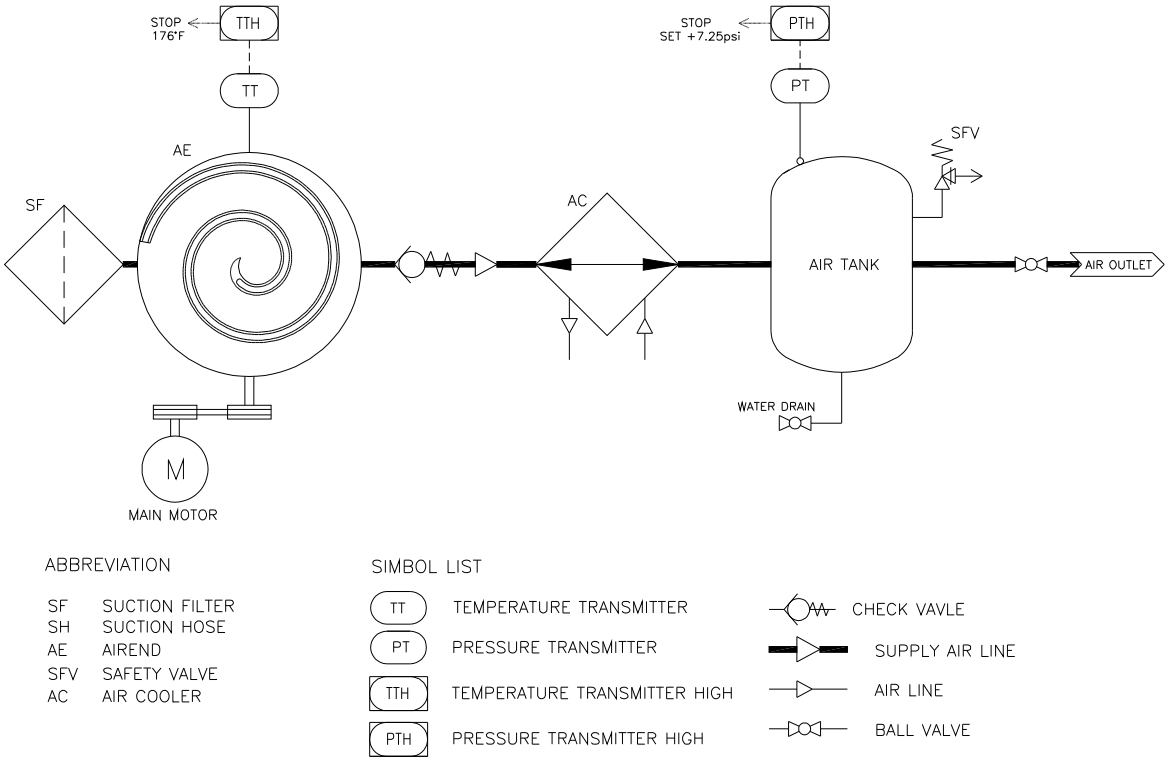
[Fig.3-5] Right View



[Fig.3-6] Rear View

3-3 System Diagram

3-3-1 CSOF-M3PL(H), CSOF-M5PL(H)



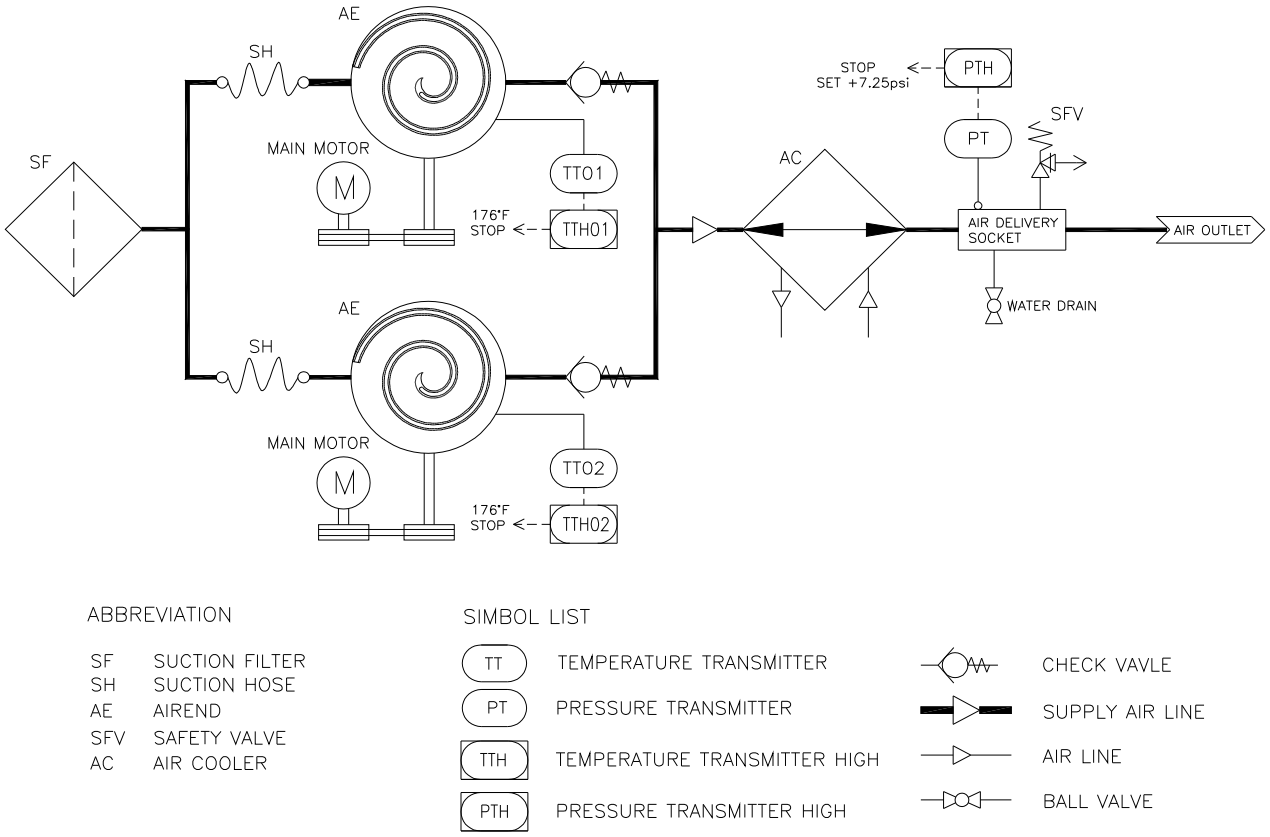
[Fig.3-7] System Diagram

The CSOF-M Series are an oil-free scroll air compressor. In an operation, a main motor is run to initiate the compression at an airend. The external air is filtered through a suction filter before entering into the airend. The compressed air is stored into an air tank via a check valve (non-return valve). The temperature of the compressed air discharged from the airend is at least 392℉. The air is primarily cooled in an air tank, and secondarily via an air cooler before being discharged. The saturated vapor phase compressed air condenses into a water that can manually be discharged via a drain valve in the air tank.

There are following four safeguards in CSOF-M3PL(H) and CSOF-M5PL(H) models:

1) **Over Current Relay (OCR) for Motor – Detects the over current of the motor to stop the compressor.**
2) **Mechanical Safety Valve – Mechanically discharges the compressed air in the air tank to the air, if the air pressure exceeds the set value. The compressor shall manually be stopped.**
3) **Temperature Sensor (Temperature Transmitter) – Detects the temperature exceeding the set value (176℉) at the bottom of the airend to stop the compressor.**
4) **Pressure Sensor (Pressure Transmitter) – Detects the pressure in the air tank and sends the value to the controller to stop the compressor, if the air pressure exceeds the set value.**

3-3-2 CSOF-S8PL(H), CSOF-S10PL(H)



[Fig.3-8] System Diagram

The basic principle of the CSOF-S8PL(H) and CSOF-S10PL(H) is equal to that of CSOF-M3PL(H) and CSOF-M5PL(H). However, the CSOF-S8PL(H) and CSOF-S10PL(H) have two airends to sequentially be started up depending on the load to be used. As there is no air tank in the compressor, a drain valve is used on the discharge end to drain the condensate water generated during the compression. For the CSOF-S8PL(H) or above, an air receiver tank shall separately be ordered and installed by the amount of air used. The tank capacity varies depending on the load to be used, for example, minimum capacity is 16gal for the CSOF-S8PL(H), and 21gal for the CSOF-S10PL(H).

There are following four safeguards in CSOF-S8PL(H) and CSOF-S10PL(H) models:

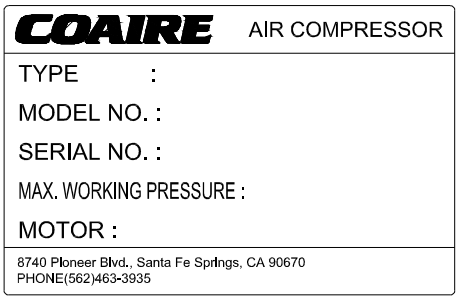
1) **Over Current Relay (OCR) for Motor – Detects the over current of each motor to stop only the motor failed.**
2) **Mechanical Safety Valve – Mechanically discharges the compressed air in the air tank to the air, if the air pressure exceeds the set value. The compressor shall manually be stopped.**
3) **Temperature Sensor (Temperature Transmitter) – Detects the temperature exceeding the set value at the bottom of each airend to stop only the motor failed.**
4) **Pressure Sensor (Pressure Transmitter) – Detects the pressure in the air tank and sends the value to the controller to stop the compressor, if the air pressure exceeds the set value.**

4.0 Installation

4-1 Inspection

When you receive the compressor please inspect it closely. Upon delivery, carefully check the compressor for damage during transportation.

If goods are received in damaged condition, it is important that you notify the carrier and insist on a notation of loss or damage across the freight bill.



[Fig.4-1] Name plate

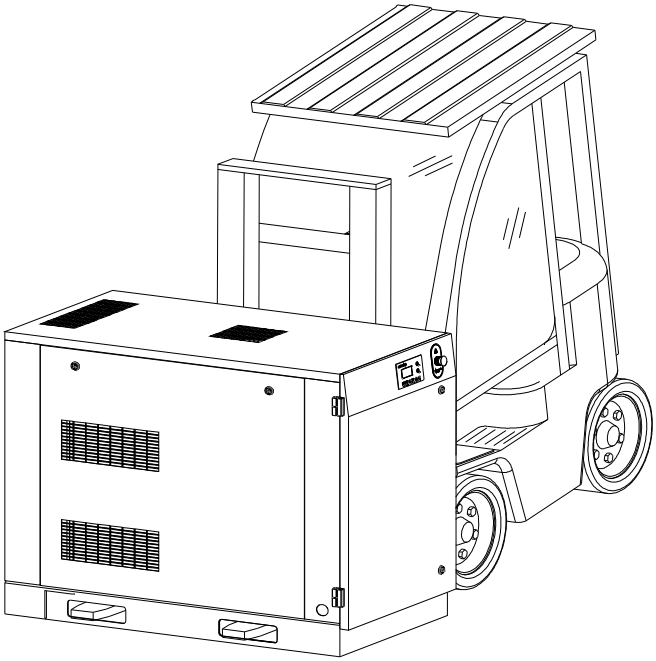
4-2 Handling

4-2-1 Handling by a forklift

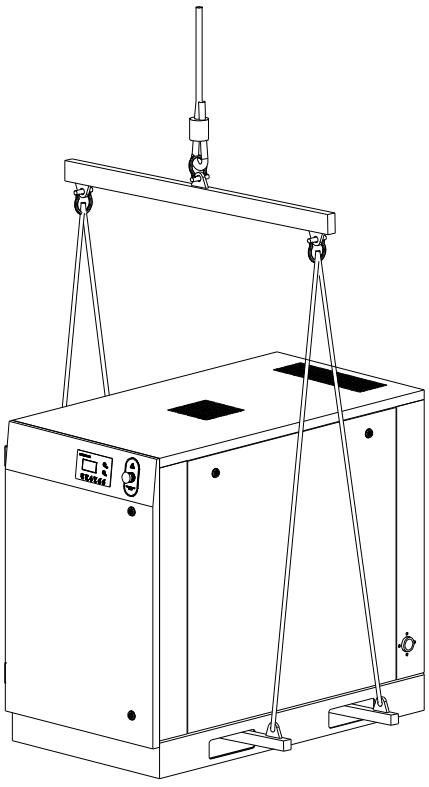
When handling by a forklift, make sure that forks completely extend through the width of the unit. (Fig.4-2)

4-2-2 Handling by a shop crane

When handling by a shop crane, use the openings provided on common base where slings or steel wire ropes can be use for lifting. (Fig. 4-3)



[Fig.4-2]

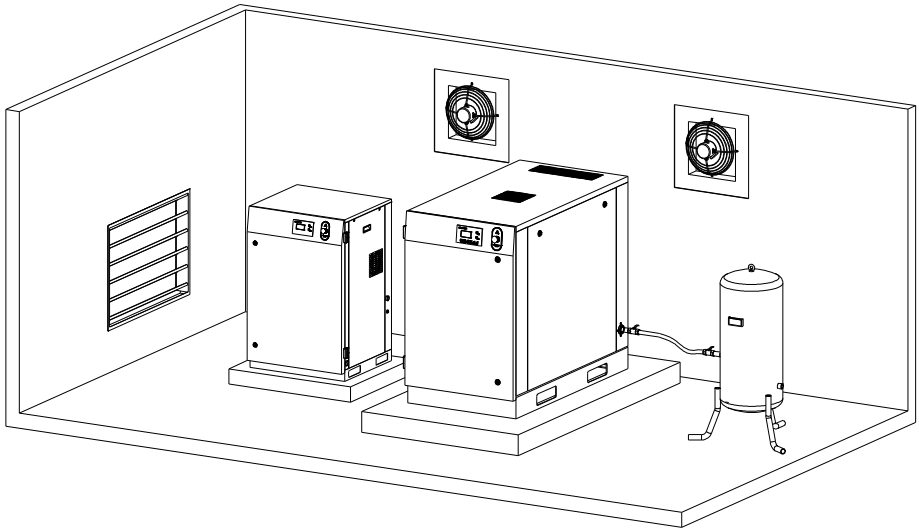


[Fig.4-3]

4-3 Installation

4-3-1 Where to Install

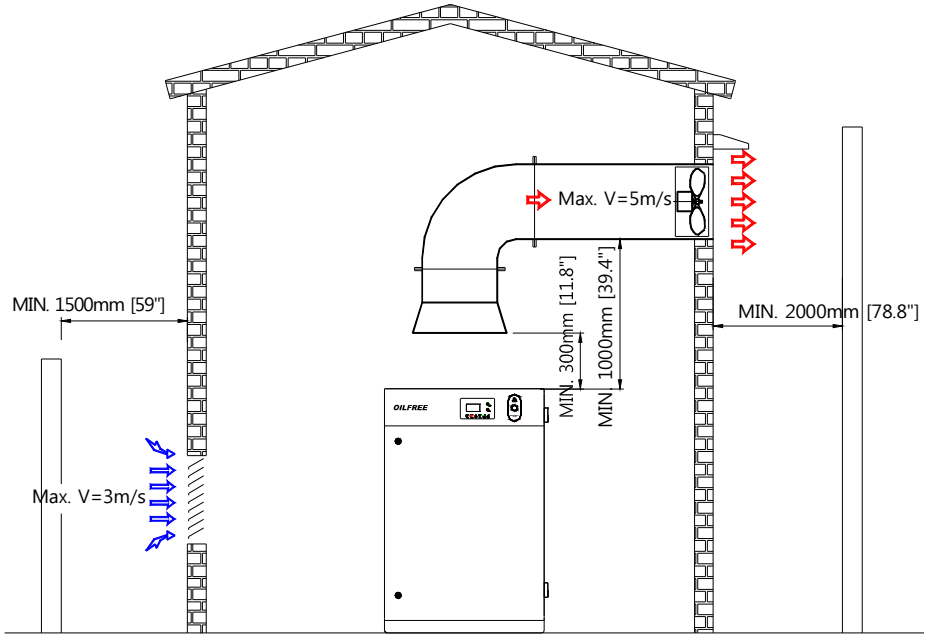
Coaire air compressor is designed for the indoor use. The ventilation facility and piping affect the performance and the service life of the compressor. Please follow the instructions in the user's manual.



[Fig.4-4] Installation of the Air Compressor

4-3-2 Ventilation

Poor ventilation in the compressor room may raise the temperature of the air discharged. If the room temperature exceeds 18℉ more than the outside temperature, sufficiently ventilate the air in the room(see Table 4-1), and install the exhaust duct, if necessary.



[Fig.4-5] Installation of the Exhaust Duct

[Table 4-1] Ventilation Fan Capacity

Model	Air Volume [ft³/min = CFM]	Hood Size [Inch x Inch]
CSOF-M3PL(H), CSOF-M5PL(H)	1060	11.8" x 23.6"
CSOF-S8PL(H), CSOF-S10PL(H)	2120	15.8 " x 31.5"

4-3-3 Selection of Where to Install

[table 4-2] Requirements for Where to Install

Item	Description
Place	- Do not install the compressor unit on the outside. - Please keep warm during the winter season, if you have to install on the outside.
Space	- Keep the space of more than 31.5inch from the wall to facilitate the repair and maintenance of the compressor - Do not place any object in front of the door.
Floor and Foundation	- The floor shall sufficiently holds the weight of the compressor. - The floor surface shall be flat with a gradient less than 1 degree to minimize the vibration. - It is recommended to install the compressor 4inch above the floor, though Coaire air compressor generates an insignificant amount of vibration.
Room Temperature	- Optimal ambient temperature is 32~104℉ during the operation. - Install the compressor at low temperature and moisture, if possible. ※ Each 18℉ increase of the inlet temperature reduces the efficiency of the compressor by 3-4%.
Hazardous Substances	- Install the compressor at the place where there is the least noxious gas, hazardous substance and dust. Those foreign substances may cause the damage of the air compressor.
Electricity	- The electric power shall have at least 150% of the reference margin. - The range of fluctuation in voltage shall be within ±10%.
Ventilation	- A ventilation fan shall be installed to forcedly ventilate the room, if the room temperature exceeds 18℉ more than the outside temperature in the summer. - For an exhaust duct, set the velocity at 5 m/s, and the static pressure at less than 5 mmAq. - Install a protective net on the exhaust outlet to prevent birds, rodents and foreign substances from entering.. - Place the inlet as low as possible.

4-4 Requirements for the Piping

1) Use a larger diameter and install the pipe without an excessive bending to reduce the pressure drop.
2) Always place a branch pipe on the top of a main pipe to reduce the discharge of oil or water.
3) For the compressed air pipes, reduce the number of sections bending and connecting, and the number of valves installed to reduce the pressure loss.
4) The increased pressure loss requires a high discharge pressure of the air compressor. Consequently, it causes the power loss. The water stays wherever the pipe is sagging to increase the pipe resistance, which may cause winter-sowing. Thus, consider the pipe straightness when installing the pipes.
5) Install a bypass piping on each equipment for a maintenance.
6) A scroll air compressor has a check valve in the system. Installing more check valves between the compressor and the air receiver tank may cause a malfunction of the compressor.
7) Always install a drain valve on the bottom of a vertical pipe for the prevention of a winter-sowing.

4-5 Wiring

1) Extremely low or high voltage power supply may cause the failure of the compressor. Low power capacity also causes significant voltage drop when starting up the compressor. The compressor requires at least 85% of the rated voltage for a start-up, which shall be maintained within ±10% of the rated voltage during the operation. The inter-phase voltage imbalance shall be within 2%, not exceeding 3% even in a special case.
2) Features and Capacity

   See Table 4-4 Electrical Specification for an appropriate electric power, an operating current and a starting current. Considering that the discharge air pressure abnormally exceeding the rated operating pressure increases the operating current, wiring shall allow about 120% of the rated capacity of a main transformer.
3) See Table 4-4 Electrical Specification for the electric power [kW] and the power factor [%].
4) Minimum Capacity of Transformer [kVA] = {Electric Power [kW] / Power Factor [%]} x 100 x 1.2
5) Longer lead-in wiring of the main power may cause the compressor failed or tripped during the start-up due to the voltage drop in the line. Select the thickness of the cable so that it maintains at least minimum starting voltage.
6) The calculation of the voltage drop based on the line length is as follows:

   3-Phase 3-Line Type Connection:

$$e = \frac{30.8 \times L \times I}{1000 \times A}$$

   Where,

   I = Current [A] A = Cross Section of Cable [mm2] e = Voltage Drop [V] L = Length of Cable [M]

7) It is recommended that the thickness of the cable shall allow more than the minimum requirement specified for a power condenser, and the length of the cable shall be within 1.5 m. No wiring is necessary if there is a power condenser with a sufficient capacity in the bus conductor.
8) Leave intact the factory specification of the overcurrent protection device. If the change is unavoidable, keep the set values within the range specified in the user's manual. The cable shall allow more than the minimum requirement specified.
9) As the operating current varies depending on a given condition, it is recommended to allow about 20% extra.
10) Install a circuit breaker in the main power to protect the motor. The circuit breaker shall have a built-in electric leak breaker.
11) Use the ground terminal on a motor or a control box to earth the equipment.

[Table4-3] Type of Grounding

Type	Ground Resistance	Thickness of Grounding Conductor	Application
1st-Class Grounding	10Ω	2.6 mm^2 or above	High Voltage Equipment
2nd-Class Grounding	150Ω/1-Line Ground Current or below	2.6 mm^2 or above	Neutral Point of Transformer
3rd-Class Grounding	100Ω	1.6 mm^2 or above	Equipment with Low Voltage Less than 400 V
Special 3rd-Class Grounding	10Ω	1.6 mm^2 or above	Equipment with Low Voltage More than 400V

Causion

1) As the grounding on a steel structure of the building may cause the failure of the operation, always earth on the ground. The maximum allowable length of the grounding conductor is 20 m.
2) If there is a risk of inductive interference on an electronic calculator or a telecommunication equipment, install a surge killer on the magnetic switch used.
3) The compressor has a complete wiring inside, and no separate wiring or maintenance is necessary. If any maintenance is needed, see the circuit diagram in the user's manual provided with the compressor.

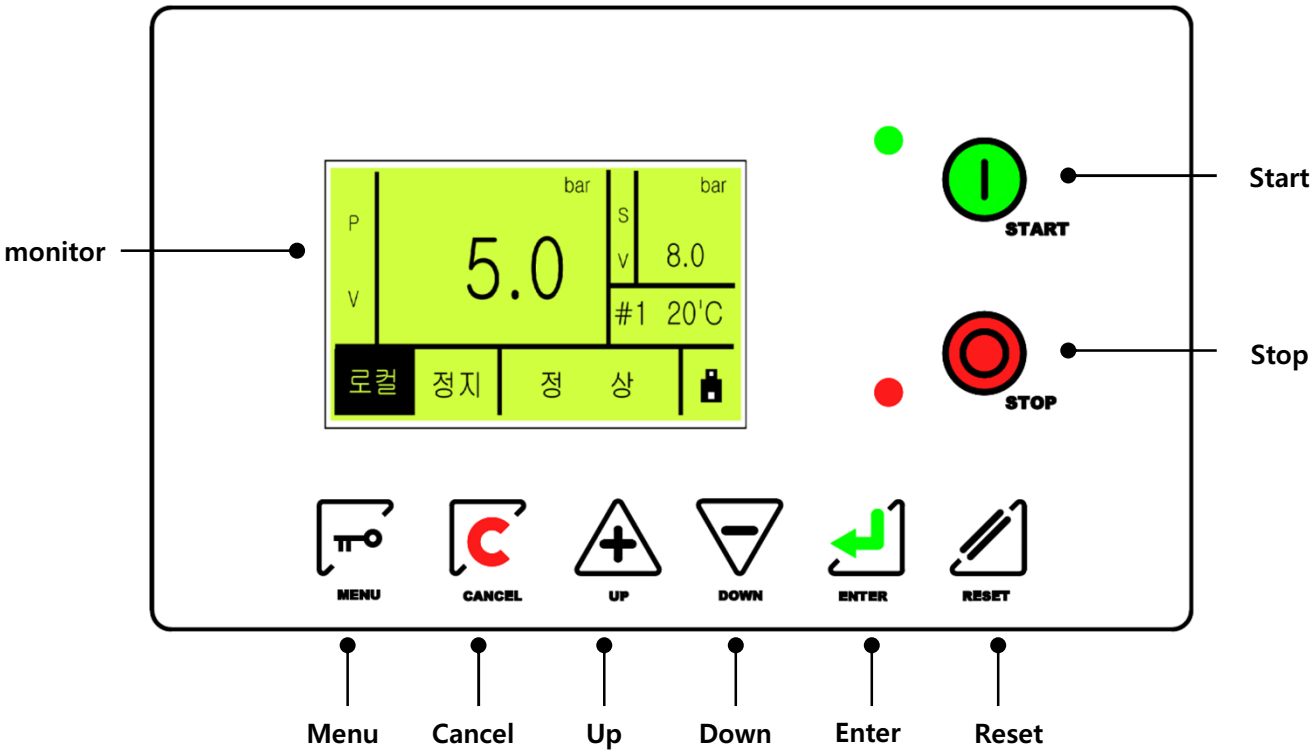
[Table 4-4] Electrical Specification(3 Ph)

Model (Poles)	Voltage	Output	Input	Driving Current	Starting Current	MCCB		OCR	Main Power Cable	Ground
	[V]	[kW]	[kW]	[A]	[A]	AF [A]	TRIP [A]	SET [A]	AGW	GV [㎟]
CSOF-M3PL(H) (4P)	208-230	2.2	2.84	8.4	63.8	30	15	10	15	2.5
	460			4.2	32.3	30	10	5	15	2.5
CSOF-M5PL(H) (4P)	208-230	3.7	4.53	14-13.2	93.8	30	20	15.8	15	2.5
	460			6.6	44.8	30	15	7.9	15	2.5
CSOF-S8PL(H) (4P)	208-230	2.2 / 3.7	2.84 / 4.53	8.4 / 14-13.2	63.8 / 93.8	50	40	10 / 15.8	11	4
	460			4.3 / 6.6	32.3 / 44.8	30	20	5 / 7.9	15	2.5
CSOF-S10PL(H) (4P)	208-230	3.7 X 2EA	4.53 X 2EA	14-13.2 X 2EA	93.8 X 2EA	50	50	15.8 X 2EA	9	4
	460			6.6 X 2EA	44.8 X 2EA	30	30	7.9 X 2EA	15	2.5

5.0 Operation

5-1 Commissioning (Initial Operation)

5-1-1 Structure of the Controller



[Fig 5-1] Control Button

5-1-2 Checklists before the Commissioning

1) Check if the voltage of the main power is within a normal range specified.
2) Cut the main power to connect the power line to the control panel.
3) Check the connection of pipes, a power supply and a grounding.
4) Fully open a stop valve on the discharge pipe of the compressed air.

5-1-3 Commissioning

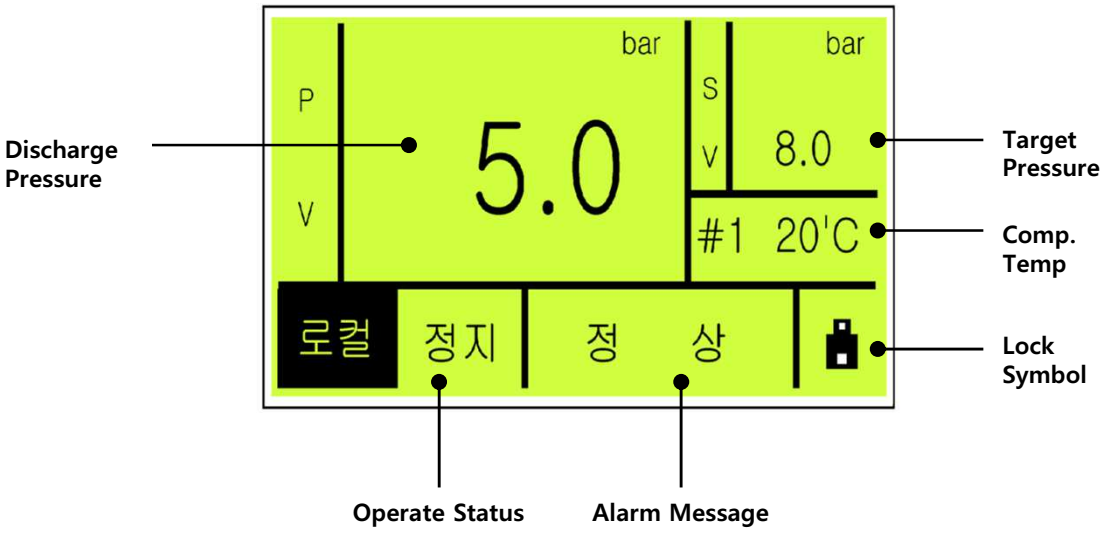
1) Push the "START" button on the controller to check the direction of rotation. If it is operated in a negative phase, immediately push the emergency stop button, turn the main power off, and then convert "R" into "T" before restarting. When the compressor starts, the pressure is increased in the airend to start the compression.
2) With the discharge valve closed on the discharge side of the air tank, check if the compressor is automatically stopped, when the pressure reaches the set value.
3) Check if there is any abnormal vibration, noise and leakage.
4) Push the "STOP" button on the controller.

5-2 Routine Operation

5-2-1 Checklists before the Operation

Check the following conditions before starting the operation.

1) Connect the main power to check the display on the monitor.
2) Push the "START" button on the controller to check if the compressor is well started up, and the indicator lamps are normally on.
3) Check if there is any abnormal vibration, noise and leakage.
4) Check if the operation is in good condition at the maximum load.



[Table 5-1] Operation Parameters

Section	Model	CSOF-M3PL(H), CSOF-M5PL(H), CSOF-S8PL(H), CSOF-S10PL(H)
Setting Pressure	psi	115(Low pressure) / 140(High pressure)
Difference Pressure	psi	Stop : 115(Low pressure) / 140(High pressure) Re-start : 93(Low pressure) / 120(High pressure)
High temp. stop	℉	176 (@ Airend)
Starting Method		D.O.L

5-2-2 Start-Up

1) Check if the tank pressure is 0 psi.
2) Check if the monitor indicates a normal condition for the operation, and then push the "RUN" button.
3) Fully open the valve on the discharge side before starting the compressor.
4) Check if there is any abnormal noise, and the operation is in good condition.

5-2-3 During the Operation

1) With a full load, check the values indicated by the instruments. Also check if the indicator lamps are normally on in the control panel.
2) Pull the ring on the safety valve every 500 hours to check if the operation is normal.

[Table 5-2] Checklists During the Operation

Section	Regulation	Re-mark
Airend Temp.	Max. 176℉(@Airend)	
Amb. Temp.	32~104℉	
Lamp on during the operation	Sart	
Input voltage	±10% of rated voltage	
Pressure gap of unit and discharge	Max. 7.25 psi	

5-2-4 Stop

1) Push the "STOP" button.
2) Turn the main power off.
3) Check if the internal pressure is completely discharged from the compressor.

5-2-5 Operation Log

Regularly record the information about the operation events in the operation log to early find the failure of the compressor and to prevent the accident before happens. The information includes the discharge pressure, operating time, maintenance items and the time to replace the parts. There is a sample operation log attached in the user's manual.

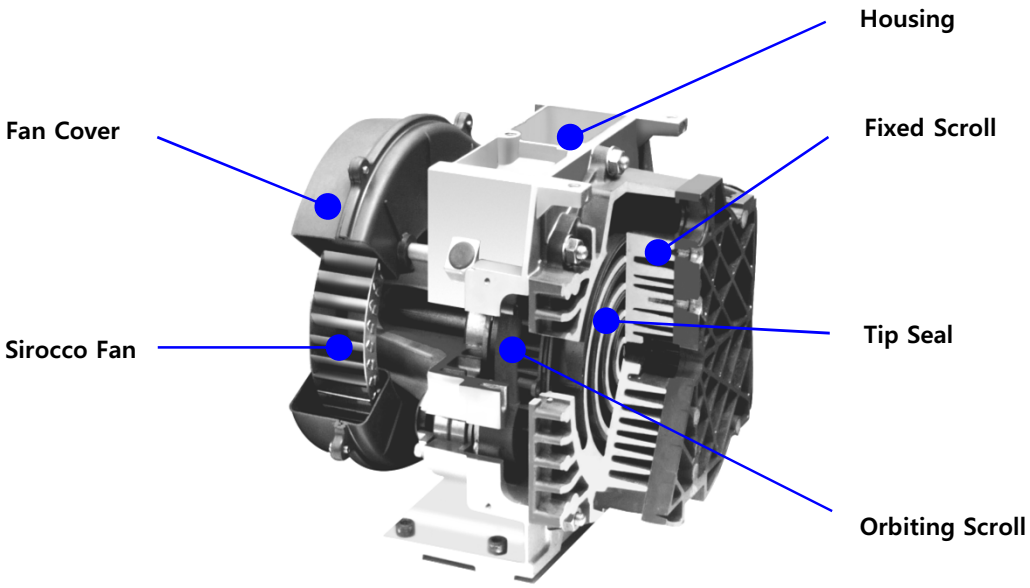
Warning

1) It is extremely hazardous to disassemble the valves or pipes from the compressor system during the operation.
2) Always check if the pressure is 0 psi in the tank before disconnecting the valves or pipes.
3) Since the tank is still hot for a certain time even after the operation is stopped, there is a danger of burns if you are not careful.
4) The rotating parts in the compressor is extremely dangerous during the operation.
   Do not come near the parts until the compressor is stopped and the main power is turned off.

6.0 Functional Descriptions

6-1 Airend

An oil free scroll airend is the most important part in the compressor. In any case, the oil is not entered into the compression chamber. As the inside of the compression chamber is delicate, entering the dusts or foreign substances results in a serious damage to the compressor. The airend consists of precision parts, and needs a special jig for a repair and maintenance. It shall only be disassembled by our qualified engineer or a comparable person.

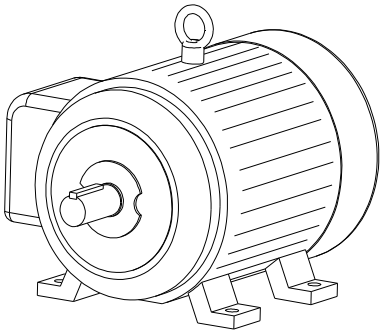


[Fig.6-1] Airend parts

6-2 Motor

Some models of the scroll air compressor are equipped with several motors for an automatic operation based on the amount of air used. The motor is a 3-phase induction motor that has a service factor higher than a general motor, and is designed to generate a high efficiency suitable for an air compressor.

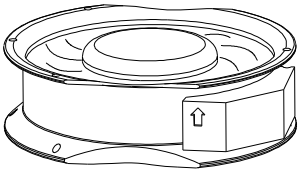
The motor plays an important role for the operation of the air compressor, and needs maintenance on a regular basis.



[Fig.6-2] Motor

6-3 Fan

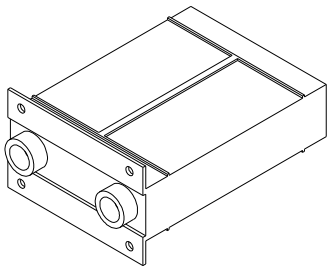
Fan is key part to keep proper temperature of airend, please keep clean and periodically remove dust and foreign object not to dysfunction.



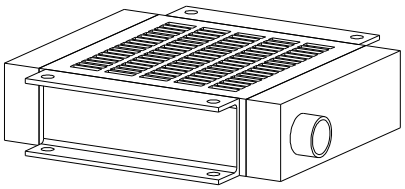
[Fig.6-3] FAN

6-4 Cooler

A cooler element is an aluminum cooler that is designed to be used up to 217.5 psi. Dust may increase the temperature in the cooler pin, which needs to be cleaned with the compressed air or a detergent on a regular basis. When cleaning, cover the electric parts to keep the water out.



CSOF-M3,5PL(H)



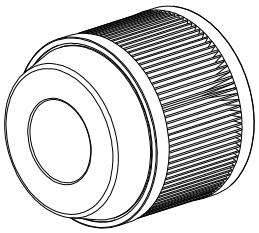
CSOF-S8,10PL(H)

[Fig.6-4] COOLER

6-5 Suction Filter

An airend consists of precision parts that need a clean air to be used for an optimal service life. Coaire air compressor is equipped with a paper suction filter that has 99.9% of the dedusting efficiency. The filer needs to be replaced every 2000-3000 hrs. If it is unavoidable circumstance, the reuse is only allowed once after cleaning.

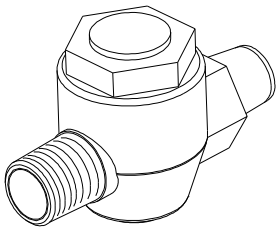
※ Make sure to use only the genuine Coaire suction filter.



[Fig.6-5] SUCTION FILTER

6-6 Check Valve

A check valve plays an important role in the scroll air compressor. The valve prevents the backflow of the compressed air when the compressor is stopped to protect the compressor from damaging due to a back-lashing. The valve also protects the wrap of the compressor from damaging due to foreign substances back flown from the pipe to the compressor. The valve is designed to stand against a repetitive pulse motion of scroll at a high temperature 392℉ or above.



[Fig 6-6] CHECK VALVE

7.0 Control

7-1 Controller

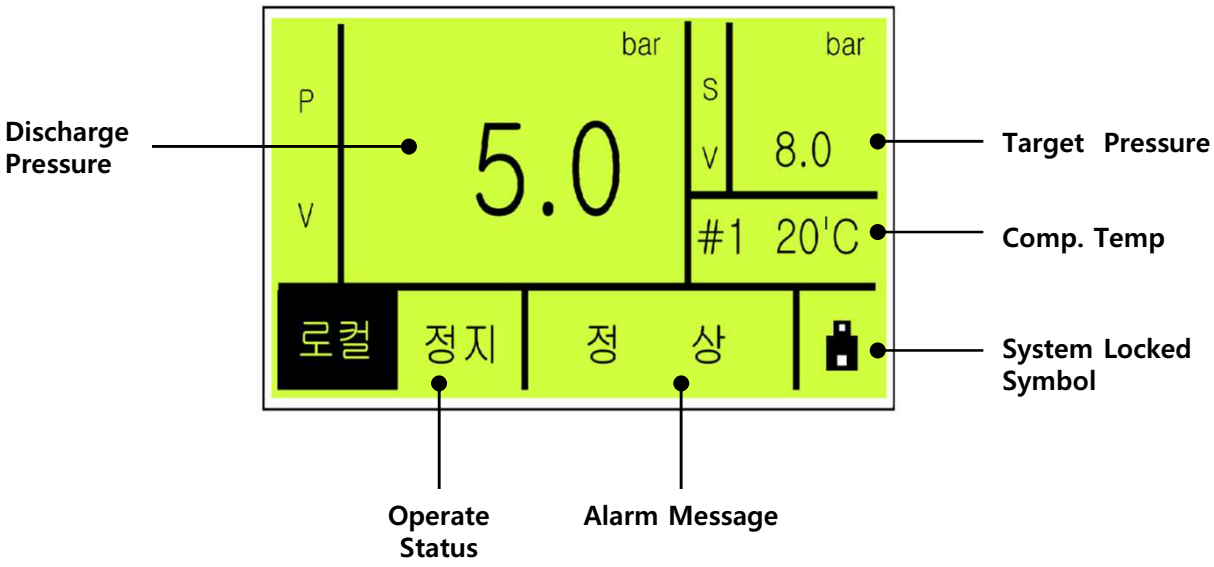
Coaire air compressor uses a controller based on a microprocessor for an optimal operation of the compressor. The controller is a system that precisely determines the time to adjust the capacity to save the energy, gives an alarm to prevent the accident before happens, and notifies the information necessary for repair and maintenance. The system ensures the best automatic operation optimized by the set conditions and the machine conditions.

7-1-1 Operating Conditions

1) Power Supply : AC24V ±15% 50/60Hz 40W
2) Transformer Capacity : Min. 50[VA]
3) Operating Temperature : 14℉ ~ 140℉
4) Operating Moisture : 95% @104℉
5) Storage Temperature : -22℉ ~ 176℉

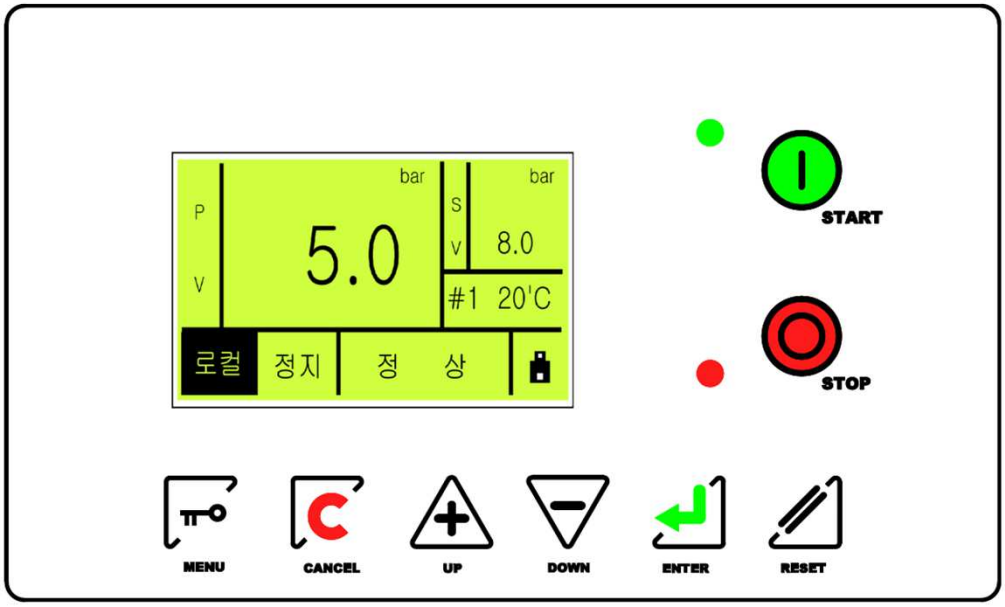
7-2 Major Functions

7-2-1 Display



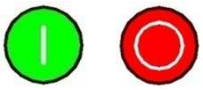
[Fig.7-1] Display of the Controller

7-3 Configuration of functions



[Fig.7-2] Keypad of Controller

[Table 7-1] Description of Keypad

STRAT / STOP		Enter started condition/Exit started condition
RESET		Reset and clear fault condition
MENU		Enter to Menu table
ENTER		Confirm selection of value adjustment
UP / DOWN		Scroll up/down through menu, menu item options or increment/decrement value
CANCEL		Step back one menu navigation level

7-3-1 Status Display Ramp

STATUS LED	Green	Display working status along ON / OFF
FAULT, ALARM LED	Red	Display fault or alarm status along ON / OFF

※ NOTE

1) ON : illuminated continuously
2) SF : slow flash on/off once per second
3) FF : fast flash on/off five times per second
4) IF : Intermittent Flash on/off every four seconds
5) OFF : Extinguished continuously

Machine state Number	Machine state	Status(Green)	Fault (Red)
00	Initialization	OFF	Normal: OFF Trip: FF Alarm: SF Maintenance: IF Start Inhibit: IF
01	Start Inhibit Check	OFF	
02	Ready to Start	OFF	
03	Start Delay	IF	
		if load request : FF	
04	Standby	IF	
06	Start Motor in star Delta	IF	
		if load request : FF	
07	Load Delay	IF	
		if load request : FF	
08	Load	ON	
09	Reload Delay	IF	
		if load request : FF	
10	Auto stop delay	IF	
11	Manual stop delay	SF	
99	Shut down	OFF	

7-3-3 Equipment Status Display

1. START/STOP REQUEST SOURCE DISPLAY **LOC : Controller keyboard** **NET : Communication request** **REM : Digital inputs**
2. LOAD REQUEST SOURCE DISPLAY **PRE : Pressure sensor** **NET : Communication request (Option)** **REM : Digital inputs**
3. STOP STATUS DISPLAY **Display while compressor stopped.** **LOC STP : Stopped by controller keyboard** **REM STP : Stopped by digital inputs** **NET STP : Stopped by communication request (Option)** **S.D STP : Stopped by fault condition**
4. START STATUS DISPLAY **Display while compressor started.** **LOC RUN : Started by controller keyboard** **REM RUN : Started by digital inputs** **NET RUN : Started by communication request (Option)**
5. COMPRESSOR STATUS DISPLAY **GOOD : Normal condition** **MAINTEN : Maintenance required** **ALARM : Alarm condition** **S-DOWN : Trip condition** **INHIBIT : Start inhibit condition**

7-3-4 System Locked

	SYSTEM LOCKED SYMBOL

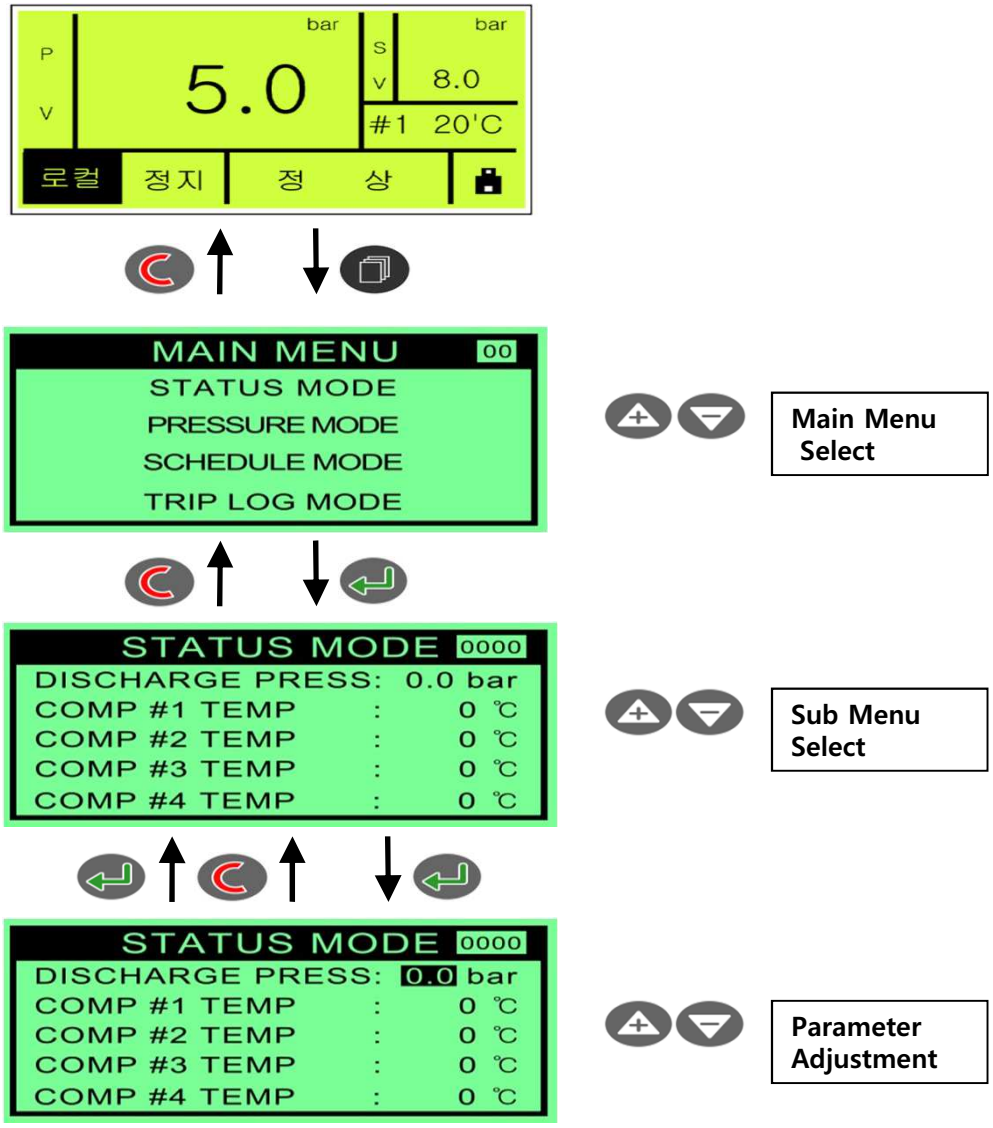
7-3-5 Digital Input Symbols

Symbol	Description	Remark
DI1	Over-load Main Motor #1	fault (open)
DI2	Over-load Main Motor #2	fault (open)
DI4	Emergency Switch	fault (open)
DI5	Remote Start/Stop Control	Run (closed)
DCM	INPUT	fault (open)

7-3-6 Digital Output Symbols

Symbol	Description	Description
N1	Compressor #1 Main Magnetic Contactor	On
N2	Compressor #2 Main Magnetic Contactor	On
NC1	N1, N2	
N4	Run	On
N5	Alram	On
NC2	N4, N5	

7-3-7 Menu structure and navigation

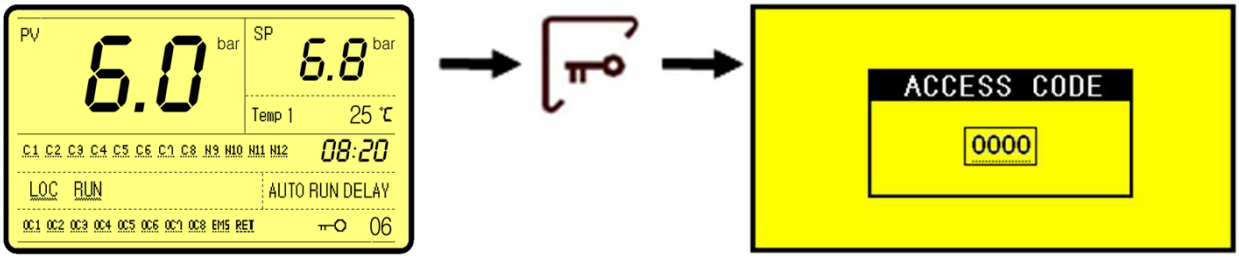


[Fig.7-3] Menu structure and navigation

7-3-8 Menu level

ACCESS LEVEL	USER (CODE = 0000)	SERVICE 1 (CODE = 0100)
ACCESS-ABLE MENU	00. STATUS MODE 01. PRESSURE MODE 02. SCHEDULE MODE 03. TRIP LOG MODE 04. TRIP SET 05. OPERATION SET 06. COMP SET 07. CONFIG MODE	00. STATUS MODE 01. PRESSURE MODE 02. SCHEDULE MODE 03. TRIP LOG MODE 04. TRIP SET 05. OPERATION SET 06. COMP SET 07. CONFIG MODE 08. FACTORY SET
TIMEOUT PERIOD	1 MINUTE	10 MINUTE

Press "MENU" button for a seconds in status mode, an access code entry display (Fig. 7-4) is shown. Use "PLUS" button to adjust value then press "ENTER" button. If the access code have been entered to authorized, menu page will be displayed. An invalid code will return the display to normal operation mode.



[Fig.7-4] ACCESS CODE ENTRY DISPLAY

NOTE

1) When access level is “SERVICE 1”, [Equipment Environment Setup] menu cannot be adjusted.

2) Press “CANCEL” button for three seconds at any time to return to the system locked condition.

7-3-9 Digital output

	ACCESS CODE (0100)	Editable
MENU STRUCTURE	1. . STATUS MODE	×
	2. . PRESSURE MODE	
	- TARGET PRESSURE	○
	- STEP#1~STEP#2 START PRESS	×
	- STEP#1~STEP#2 STOP PRESS	×
	- LCD LIGHT MODE	×
	3. SCHEDULE MODE	×
	4. TRIP LOG MODE	×
	5. TRIP SET	×
	6. OPERATION SET	×
	7. COMP SET	×
	8. CONFIG MODE	×

7-4 Error messages

7-4-1 TRIP / ALARM MESSAGE

Item	Description	Detect condition
1	System Error	Parameter Error
2	Emergency stop	Push the emergency stop switch
3	Press. Sensor Fault	Low Resistance, Short Circuit, Short Circuit to Earth
4	Delivery Pressure High	Detection Pressure >= [DIS. PRESS LIMIT] Reset Pressure < [DIS. PRESS LIMIT -7.25psi]
5	Comp #1 Fault	Detection [Digital Input :ID1] OPEN Reset [Digital Input : ID1] CLOSE
6	Comp #2 Fault	Detection [Digital Input :ID2] OPEN Reset [Digital Input : ID2] CLOSE
7	Comp #1 Temp.	Detection Comp#1 Temp. >= [COMP TEMP LIMIT] Reset Comp#1 Temp. >= [COMP TEMP LIMIT] -9℉
8	Comp #2 Temp.	Detection Comp#2 Temp. >= [COMP TEMP LIMIT] Reset Comp#2 Temp. >= [COMP TEMP LIMIT] -9℉

※ An trip message is displayed that must be manually reset to clear once the condition has been resolved or no longer exists.

7-4-2 Alarm condition

Item	Description	Detect condition
1	RTC(Real Time Clock) Alarm	Detection RTC Disable (When Schedule Mode Operation) Reset RTC Enable

※ An trip message is displayed that will be automatically reset to clear once the condition has been resolved.

7-4-3 Event massage for operation information

Item	Description	Detect condition
1	1'ST POWER	The time when Initial Power UP to Controller.
2	POWER UP	The time when power up to controller System restoration by watchdog timer
3	START	The time when motor started.
4	STOP	The time when motor stopped.

8.0 Maintenance

8-1 Maintenance schedule

Low pressure (115 psi) and high pressure (140 psi) scroll enclosures

Item	action	Run Time (Hours)							Remarks
		Every Day	250 hours	500 hours	1,250 hours	2,500 hours or 1 year	5,000 hours or 2 years	10,000 hours or 4 years	
Condensate drain	drain	○							
Enclosure ventilation fan	check	○							Ensure after cooler and compressor fan are clear of debris
Control panel	check	○							Check the monitor for maintenance or alarms
Belt (consult factory for the correct belt)	Check, replace		○ (1st time)		○		●		Tighten or replace as needed
Safety relief valve	Check operation		○						
Inlet air filter #BC5KL-RK1	Clean, replace			○	●				Replace as needed based on filter condition
After cooler	Clean					○			Clean more often if necessary
Air end sirocco fan	Clean					○			
Discharge check valve #520-109-02	Check, Replace				○			●	
System piping	Check				○				Check for leaks / tightness
Temperature sensor #520-101-08	Check operation					○			Replace if not functioning properly
Pressure sensor #520-109-04	Check operation					○			Replace if not functioning properly
Motor (consult factory for motor part number and pricing)	Check insulation, bearing					○		●	
Motor pulley (consult factory for motor part number and pricing)	check						○		Check the pulley grooves for wear
Intake suction hose #520-139-00	Check, replace					○	●		
Grease bearings (3) crank bearings (1) main bearing #BC5KL-PK2	grease							●	**** high pressure scrolls need grease every 5,000 hours**
Tip seal Kit Kit #BC5KL(H)-06 - Tip seals - Back up tube - Dust seal	Replace							●	**** high pressure scrolls need tip seal change every 5,000 hours**

Check or Clean ○ Replace or Re-grease ●

Notes:

1.) The intervals suggested above are based on normal operating conditions - ambient temperature between 35° and 104°F and a clean environment. Maintenance intervals may need to be shortened depending on the operating environment.

2.) User, or a qualified technician, should carry out the maintenance based on the run hours or calendar time, whichever comes first

※ NOTE

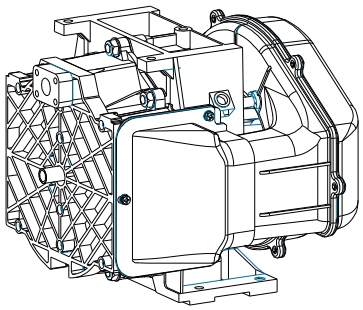
Maintenance schedule is instructed as above. The intervals are a guide based on normal operating conditions. If operated in a severe environment, necessary maintenance service should be performed on a more frequent basis. User should carry out the maintenance work, based on either the running hours or the calendar time whichever comes first.

8-2 (blank)

8-3 Maintenance

8-3-1 Regular Maintenance of the Airend

1) Check if there is any abnormal vibration or noise during a routine operation, and contact the nearest distributor, if necessary.
2) There are two types of the scroll airend: Low Pressure (115 psi) and High Pressure (140 psi). The maintenance period is different by type specified in the identification plate attached on an airend. The standard specification of Coaire airend is a low pressure type.
3) Periodically lubricate an airend with grease. See the maintenance schedule for when the lubrication is needed.



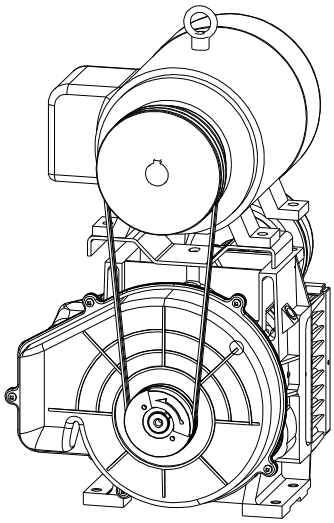
[Fig.8-1] Scroll Airend

Caution

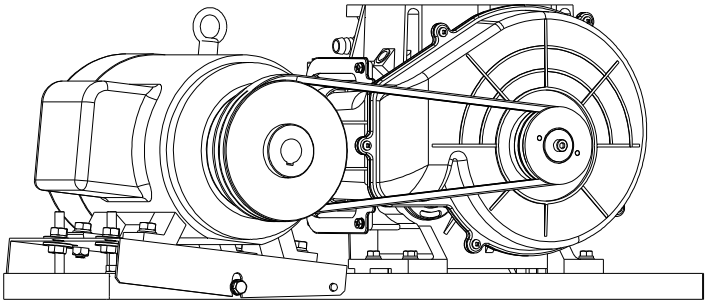
The airend consists of precision parts, and needs special tool and jig for a repair and maintenance. It shall only be disassembled by our qualified engineer. Contact the nearest distributor, if necessary.

8-3-2 Rotation of the Driving Part

If the motor is not started up or generates an abnormal noise, stop the compressor, turn the main power off, and then manually rotate the motor pulley. If it does not rotate smoothly, contact the nearest distributor for a service. It is mostly due to the damage on the motor bearing or when the airend is stuck.



[Fig.8-2] Vertical
(CSOF-M3PL(H), CSOF-M5PL(H))



[Fig.8-3] Horizontal
(CSOF-S8PL(H), CSOF-S10PL(H))

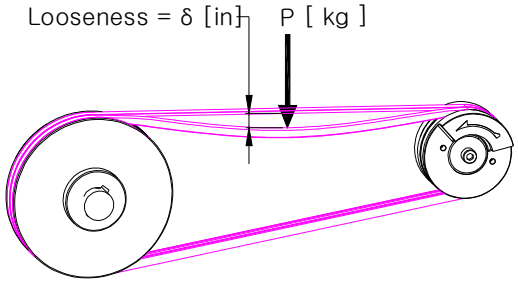
Warning

An air compressor is automatically operated. Do not come near the parts until the compressor is stopped and the main power is turned off. It may cause a serious personal injury, if hair or clothes is caught in the rotating parts.

8-3-3 Adjustment of the Belt Tension

Adjust the belt tension in first 500 hrs after the purchase, and every 3,000 hrs (6 months) thereafter in the following procedures.

1) **Use a tension-meter to measure the displacement of each belt.**
2) **Loose the anchor bolt on the motor base, and use the tension adjusting bolt to adjust the tension with reference to the [Table 8-1].**
3) **Align the motor, and tighten the anchor bolt on the motor base.**



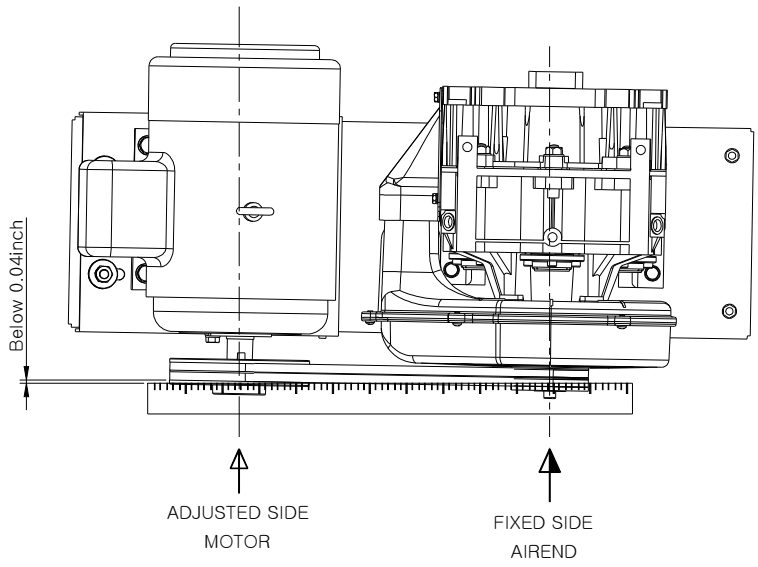
[Fig8-4] Belt tension check

Model	New		Displace	
	P kg	δ in	P kg	δ in
3HP Vertical	1.5	0.2	1.3	0.2
5HP Vertical	1.7	0.2	1.6	0.2
3HP Horizontal	1.5	0.26	1.3	0.25
5HP Horizontal	1.7	0.24	1.6	0.23

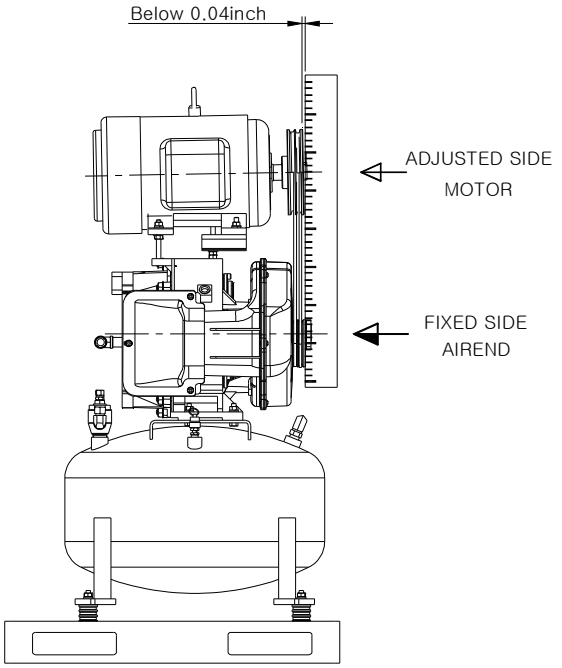
[Table 8-1] Belt tension

8-3-4 Alignment of the Belt

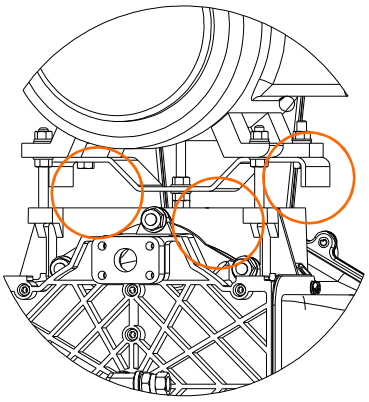
Off-centered pulleys generate the noise and vibration, and accelerate the process of wearing the belt and pulley to cause the damage to the belt. Align the center of the pulley during the replacement of a belt and the adjustment of the belt tension. With the compressor fixed, loose the anchor bolt on the motor, and place an iron rule between the pulleys as shown in the following fig. Gradually tighten the anchor bolt on the motor and check the center is aligned between the pulleys. Completely tighten the bolt, recheck the alignment, and then rotate the pulley to check if the belt moves smoothly.



[Fig.8-5] Belt align - CSOF-S8PL(H), CSOF-S10PL(H)



[Fig.8-6] Belt Align
[CSOF-M3PL(H),CSOF-M5PL(H)]



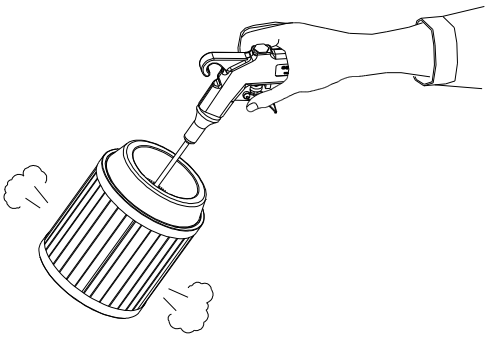
[Fig.8-7] Belt Tension Settle
[CSOF-M3PL(H),CSOF-M5PL(H)]

Caution

1) An air compressor is automatically operated. Do not check and replace the belt until the compressor is stopped and the main power is turned off.
2) Only use the belt specified by Coaire for a replacement. Do not use old and new belts mixed, and replace the entire set of belts all at once.
3) The shaft is damaged and the service life of the bearing is shorten at a high tension of the belt, while the belt is slippery at a low tension of the belt. Always keep the optimal tension value with reference to the [Table 8-1].

8-3-5 Cleaning the Suction Filter

1) Check the contamination level every 500 hrs.
2) Replace the heavily contaminated filter even before the replacement period.
3) Blow the element with the compressed air outward, and then by the side.
4) Keep dust and foreign substances out of the compressor during the assembly.



[Fig.8-8] Suction filter cleaning

Caution

A suction filter significantly affects the service life of an airend. Make sure to use only the genuine Coaire suction filter. Coaire cannot be responsible for any damage caused by an improper replacement.

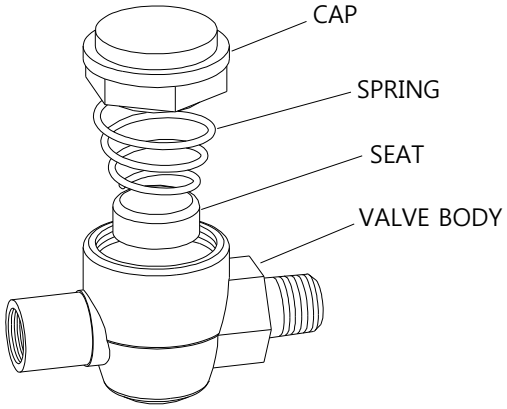
8-3-6 Check valve

Compressed air leakage may come from suction filter originated form check valve leakage. In severe case, airend Back-lash occurred. This case may cause severe damage to airend because of foreign objects from outside. To prevent possible defect, check valve every 2,500hours

1) Screw CAP open .

2) Check spring tension and SEAT of Check valve

3) Replace valve when it has been damaged.



[Fig. 8-9] Check valve

Warning

Be sure of 0 psi of air pressure. It may cause injuries or severe damages

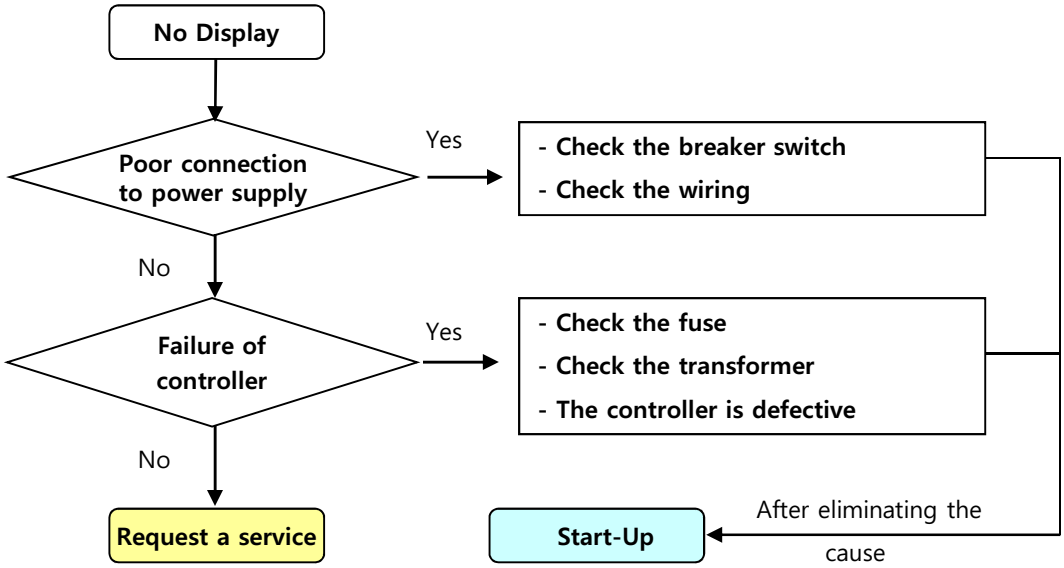
9.0 Troubleshooting

9-1 Overview

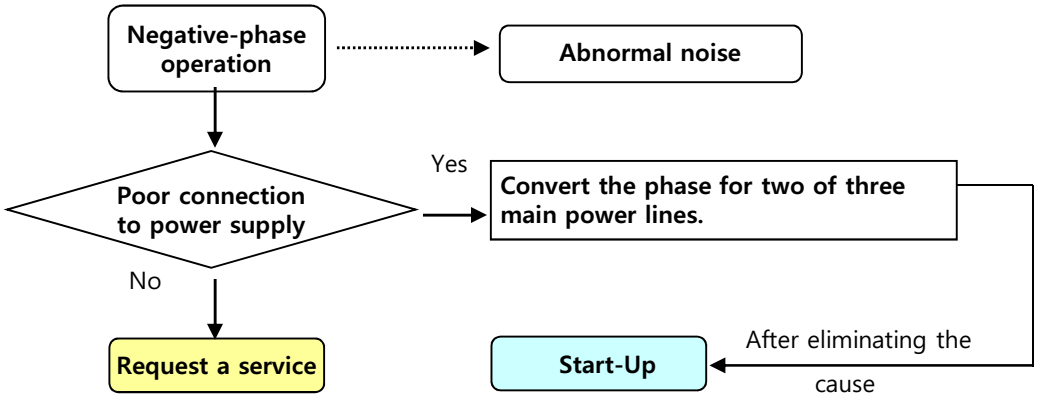
The following flow diagrams show the procedures to repair the typical failures. If the alarm is on and the compressor is stopped, do not restart the operation until the cause is clearly addressed and eliminated. Always turn the main power off, and remove the pressure from the compressor prior to a repair and maintenance.

9-2 Flow Diagram for Troubleshooting

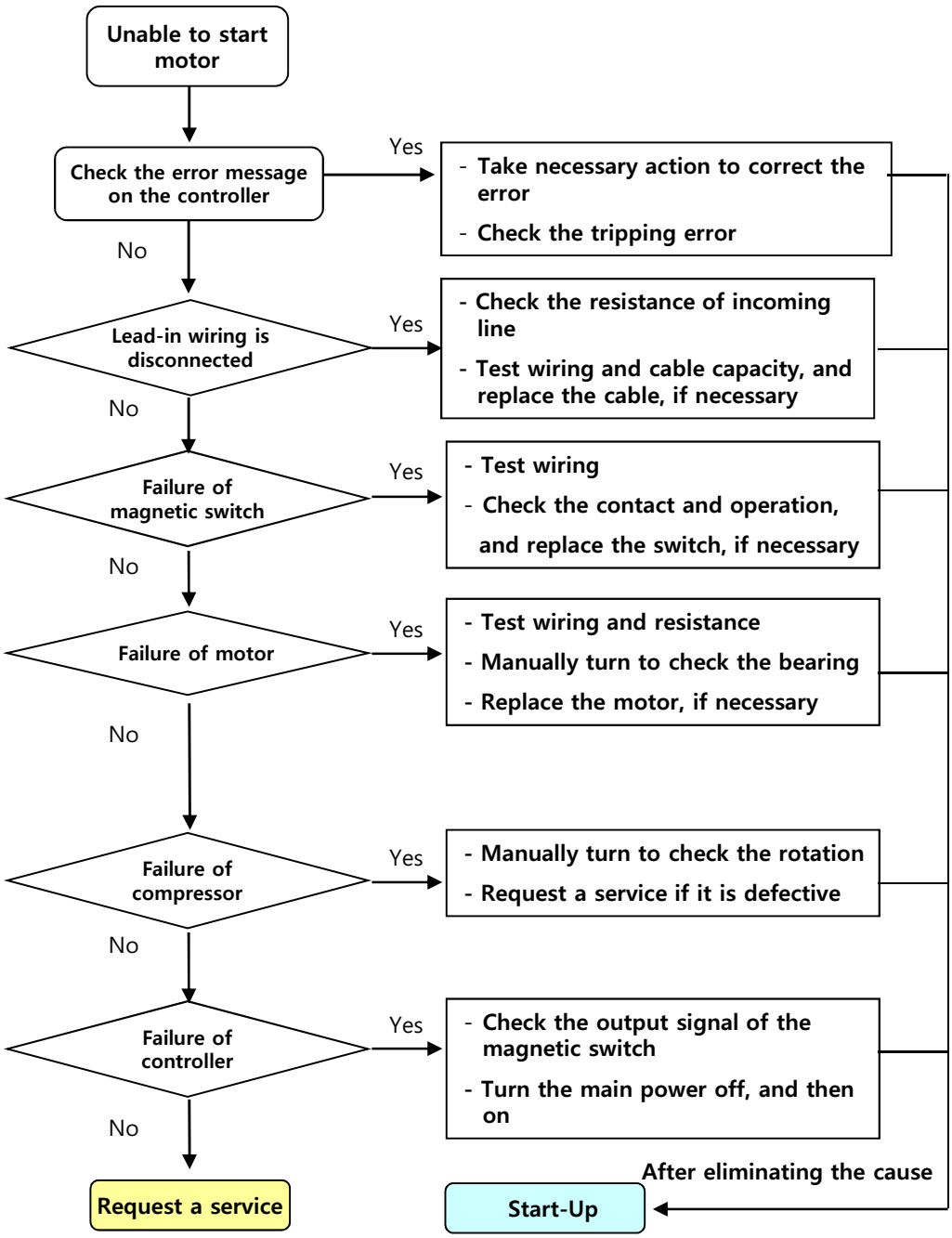
9-2-1 No Display



9-2- 2 Negative-Phase Operation



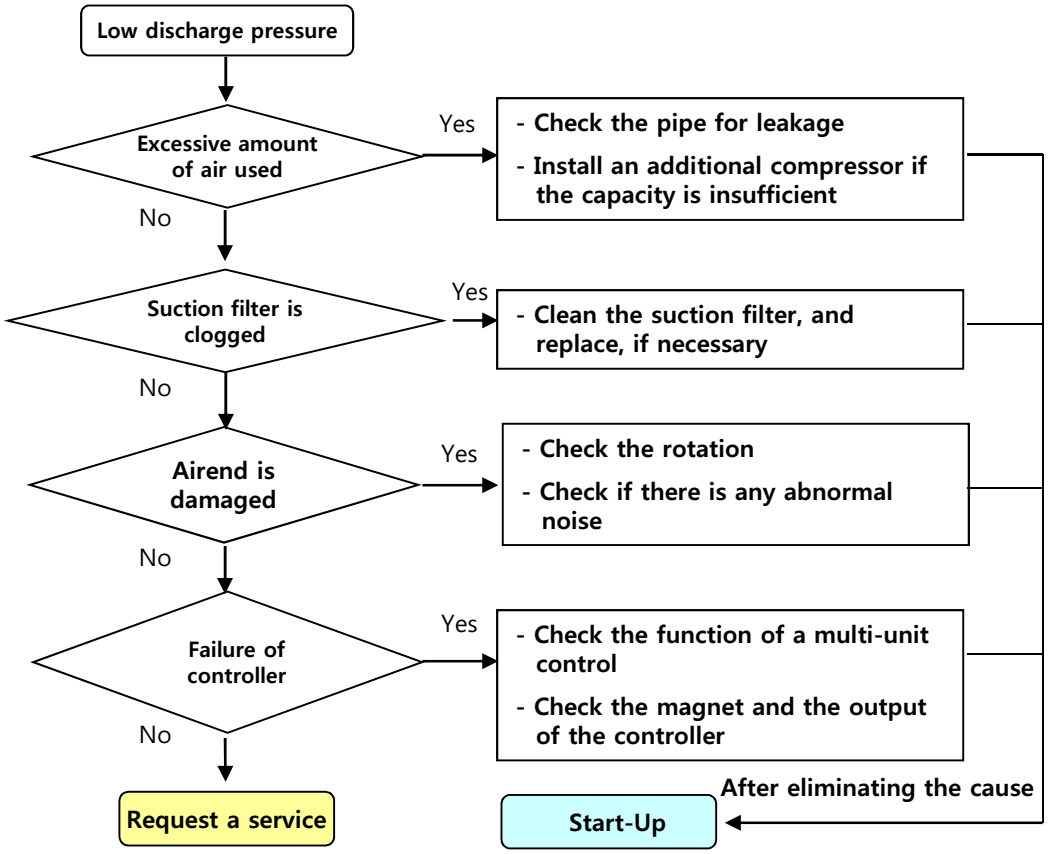
9-2-3 Unable to Start Motor


Unable to start motor
Check the error message on the controller
Yes
- Take necessary action to correct the error
- Check the tripping error
No
Lead-in wiring is disconnected
Yes
- Check the resistance of incoming line
- Test wiring and cable capacity, and replace the cable, if necessary
No
Failure of magnetic switch
Yes
- Test wiring
- Check the contact and operation, and replace the switch, if necessary
No
Failure of motor
Yes
- Test wiring and resistance
- Manually turn to check the bearing
- Replace the motor, if necessary
No
Failure of compressor
Yes
- Manually turn to check the rotation
- Request a service if it is defective
No
Failure of controller
Yes
- Check the output signal of the magnetic switch
- Turn the main power off, and then on
No
Request a service
After eliminating the cause
Start-Up

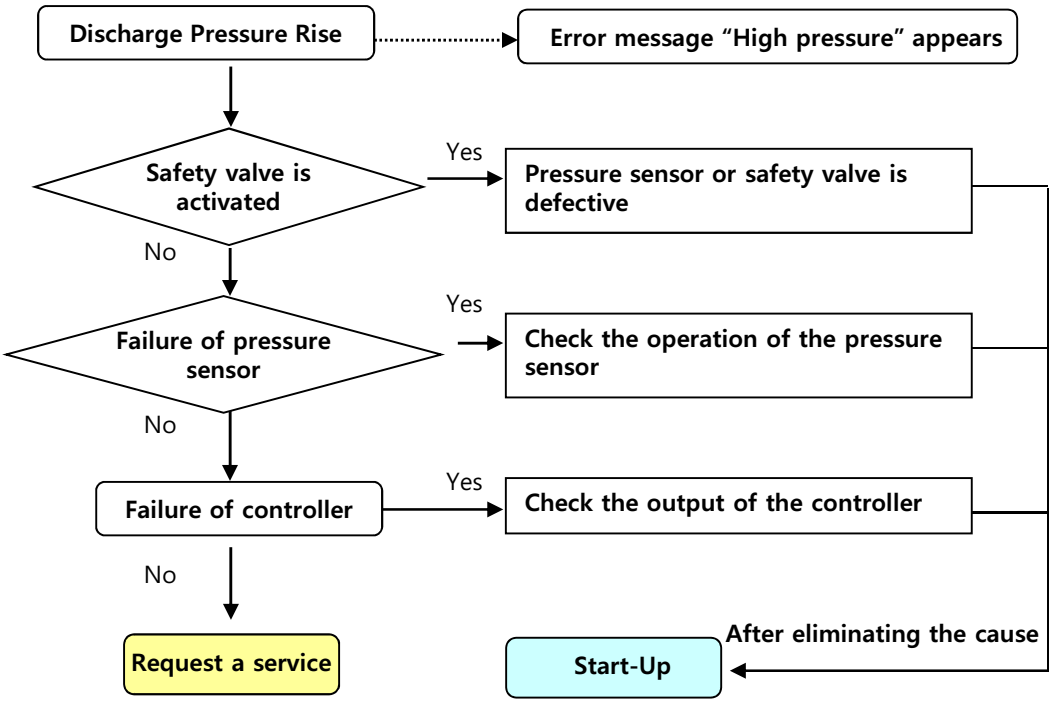
Danger

1) An air compressor is automatically operated. Take necessary safety precaution to ensure that the compressor is not unintentionally operated during the maintenance.
2) Make sure to turn the main power off prior to the rotation test.
3) Make sure to turn the main power off prior to the wiring test, except for the measurement of the voltage.

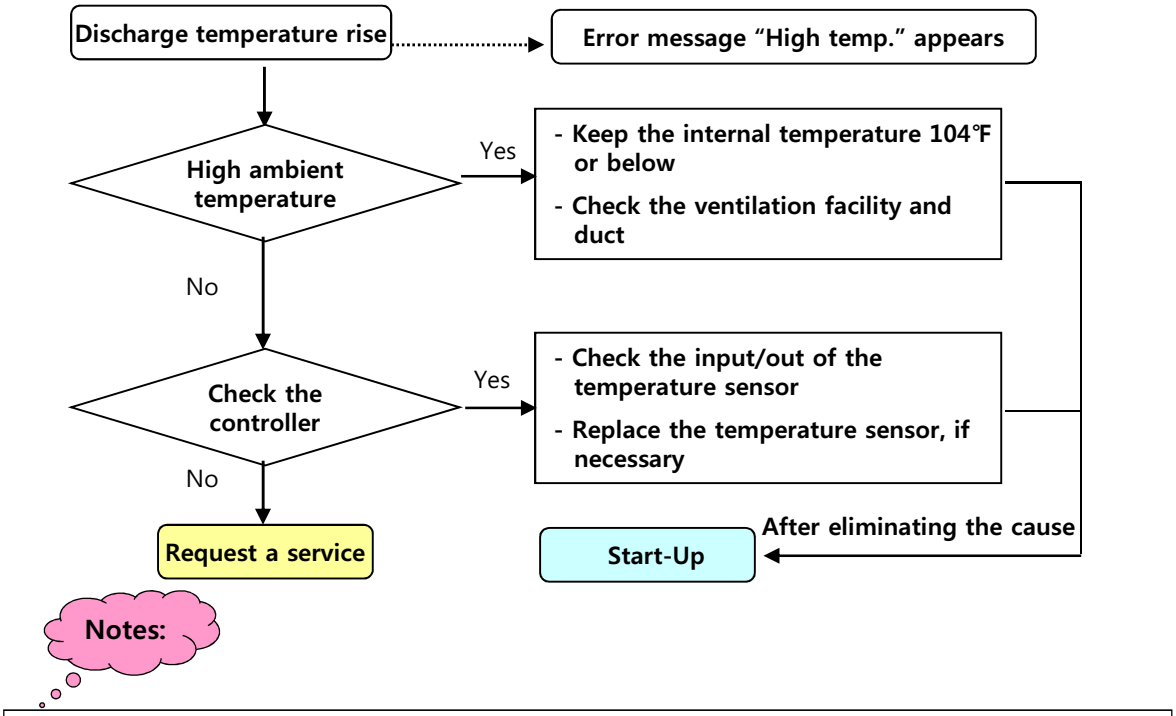
9-2-4 No Compression



9-2-5 Discharge Pressure Rise



9-2-6 Discharge Temperature Rise



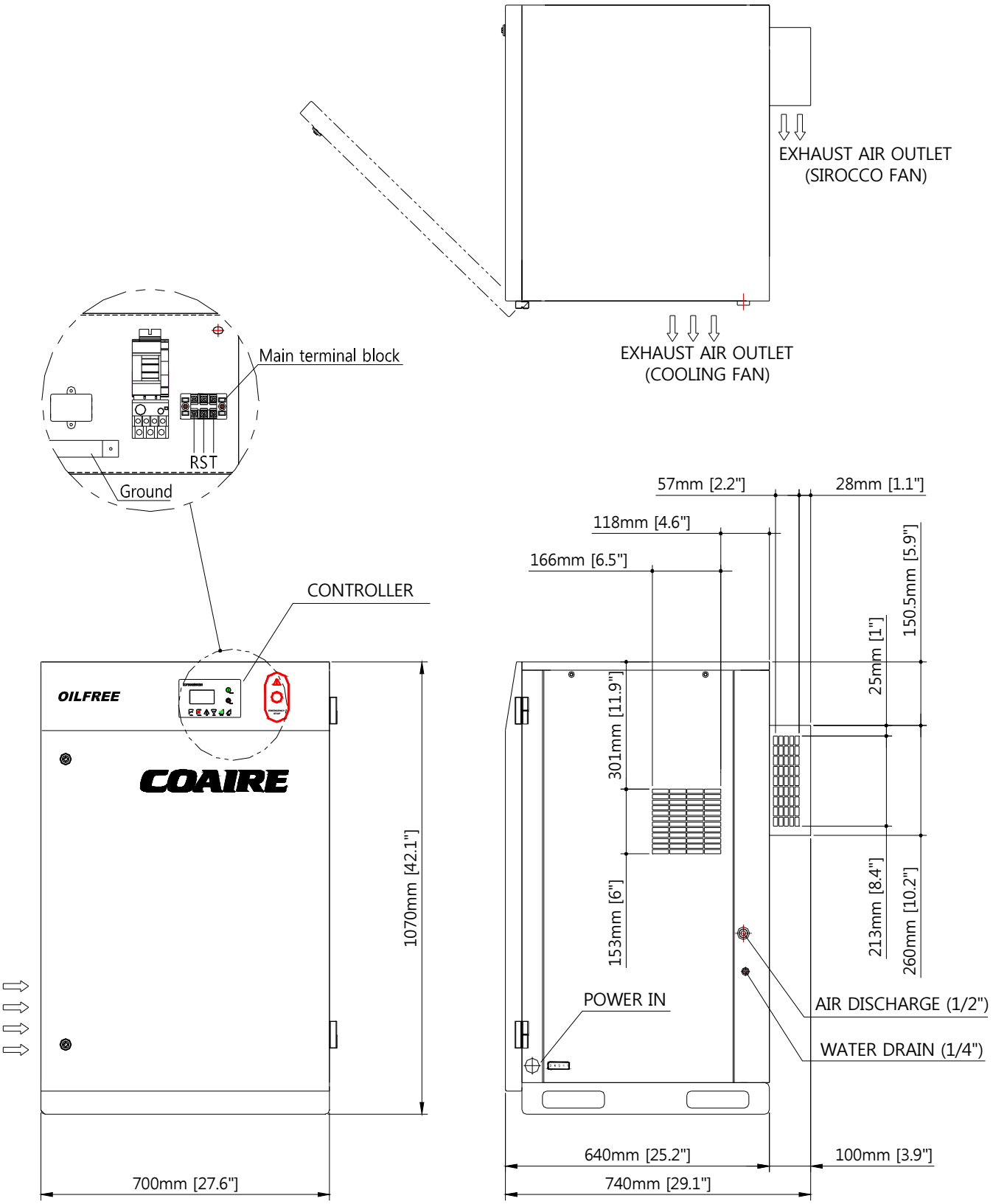
1) An appropriate temperature of an airend is 158℉ or below at the operating temperature 104℉ or below.
2) Always take necessary action if the temperature of the airend is sharply increased with no change in ambient temperature.

9-3 Other Troubleshooting

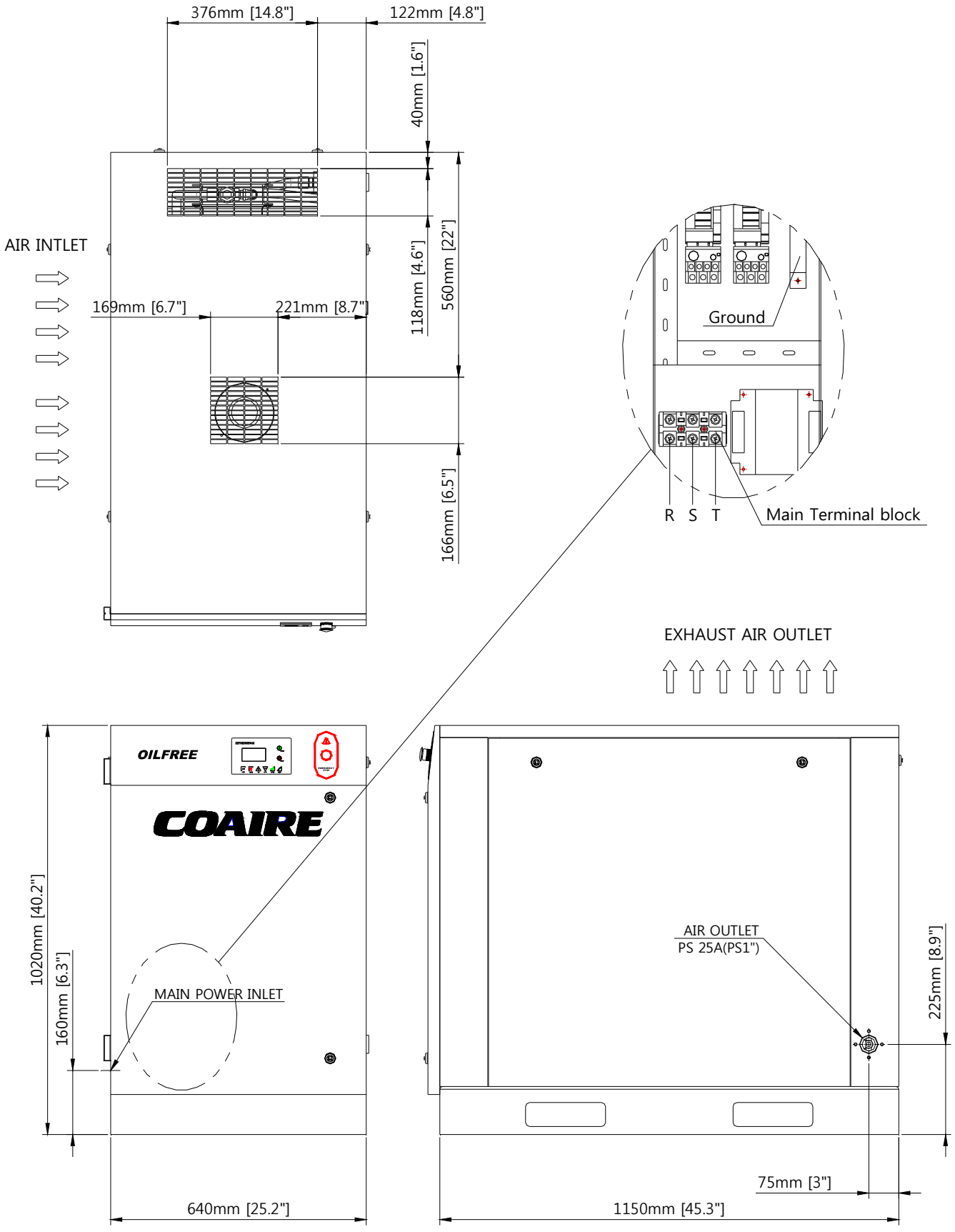
Trouble	Cause	Action
1. Tripped due to the over current in motor	1) Compressor is tripped. - Foreign substance in the compressor - Damage to the wrap of the compressor - Low voltage 2) Open-phase/Unbalanced power supply 3) Deteriorated coil in the motor 4) Failure of EOCR	1) Contact the distributor. - Improve the power supply. 2) Improve the power supply. 3) Check the motor. 4) Readjust or replace.
2. Noise and Vibration	1) Fixing bolts are loose. 2) Noise from the compressor - Bearing is worn out or damaged. - Foreign substance in the compressor 3) Improper belt tension and the damage to the parts 4) Inadequate installation of the compressor 5) Failure of cooling fan (dust or damaged)	1) Readjust. 2) Contact the distributor. 3) Realign or replace the belt. 4) Reinstall the compressor. 5) Clean or replace the fan.

10.0 Outline drawings

10-1 CSOF-M3PL(H), CSOF-M5PL(H)

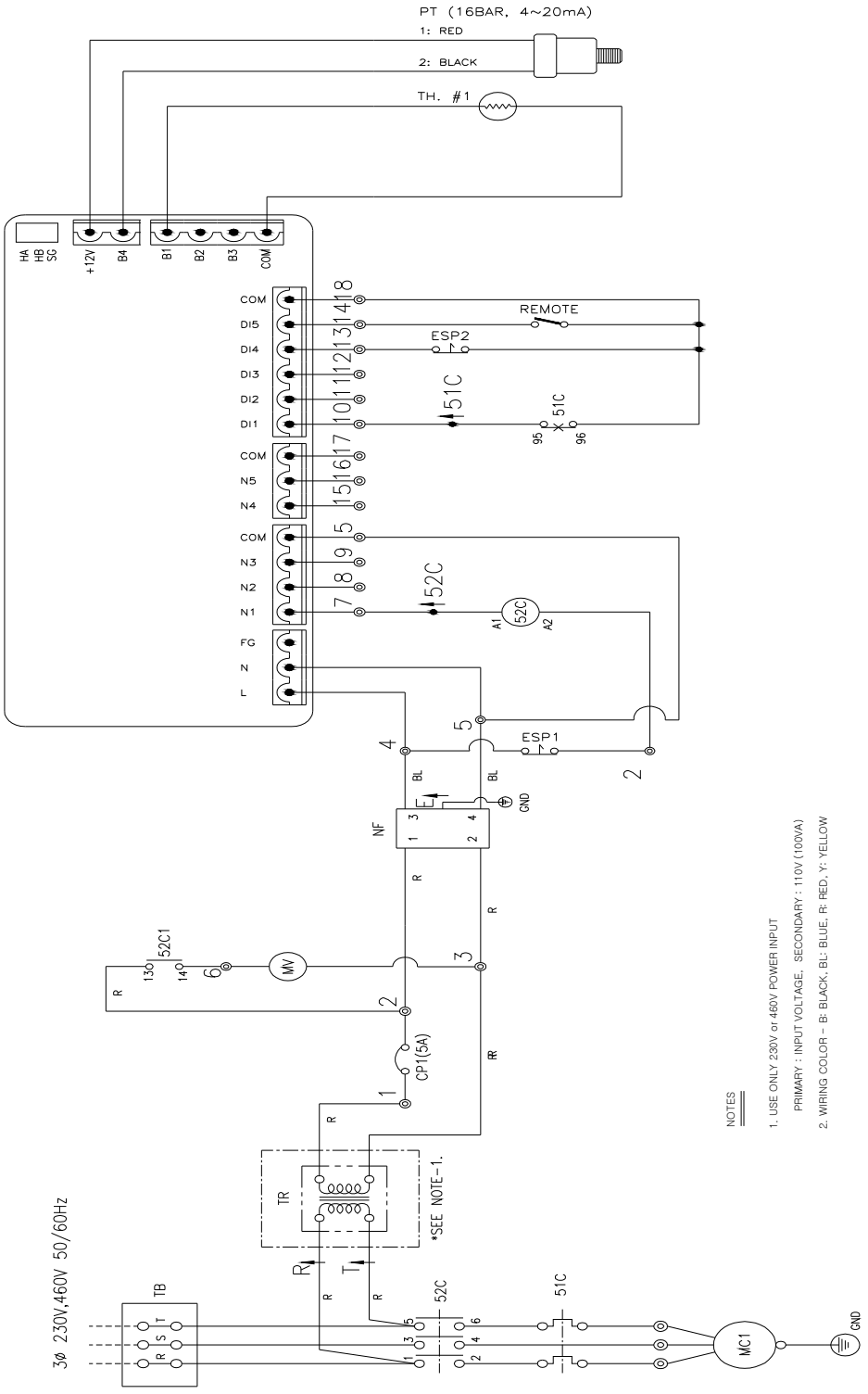


10-2 CSOF-S8PL(H), CSOF-S10PL(H)



11.0 Electrical wiring drawings

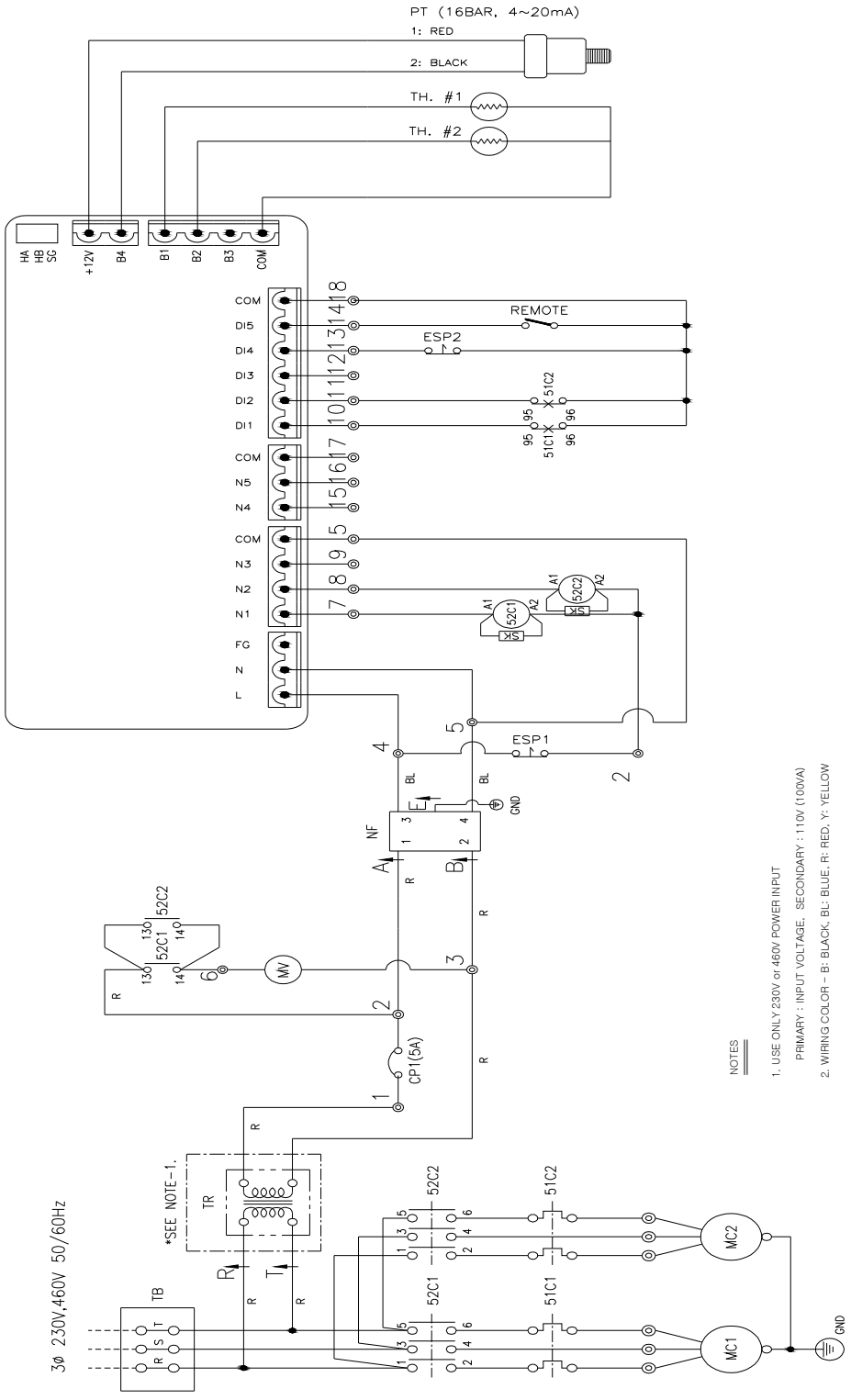
11-1 CSOF-M3PL(H), CSOF-M5PL(H)



SYMBOL INDEX

No.	SYMBOL	DESCRIPTION	No.	SYMBOL	DESCRIPTION
1	51C	OVER CURRENT RELAY FOR COMPERSSOR MOTOR	9	PT	PRESSURE TRANSMITTER
2	52C	MAGNETIC CONTACTOR FOR COMPRESSOR MOTOR	10	SK	SURGE KILLER
3	ESP	EMERGENCY STOP PUSH BUTTON SWITCH	11	TB	TERMINAL BLOCK FOR INPUT POWER SOUCE
4	F	FUSE	12	TH	THERMISTOR
5	GND	GROUND CONNECTION	13	TR	TRANSFORMER
6	MC	MOTOR FOR AIR COMPRESSOR	14	◎	TERMINAL BLOCK NUMBER FOR CONTROL WIRE
7	MV	MOTOR FOR VENT FAN	15	TEXT	WIRING NUMBER
8	NF	NOISE FILTER			

11-2 CSOF-S8PL(H), CSOF-S10PL(H)



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7	MV	MOTOR FOR VENT FAN	15	TEXT	WIRING NUMBER
8	NF	NOISE FILTER			

STARTUP REPORT

Please fill out completely and return to the factory to validate warranty.

CUSTOMER AND MACHINE INFORMATION

CUSTOMER		FACTORY SHIP DATE	/ /
ADDRESS		DATE STARTED UP	/ /
CITY/STATE		MODEL NUMBER	
PHONE		SERIAL NUMBER	
WRITTTEN BY		HOURS ON MACHINE	Hrs.

MACHINE INFORMATIONS AND INITIAL STARTUP

Compressor Environment- excellent ☐ , good ☐ , fair ☐ , poor ☐ .

Machine Location – indoors ☐ outdoors

if outdoors, protected from rain? Yes No ☐ .

Approx. ambient temperature_____ adequate ventilation? - Yes ☐ No ☐ .

Did you check for correct rotation? Yes ☐ No

Nameplate amperage for voltage used _____

Incoming Voltages

L1-L2	L2-L3	L1-L3
Volts	Volts	Volts

Full load amperage at _____ PSIG

L1	L2	L3
Amp.	Amp.	Amp.

Unload amperage at _____ PSIG

L1	L2	L3
Amp.	Amp.	Amp.

Is the machine on a level and stable surface? Yes ☐ No ☐ .

Was a flexible connector used to connect piping? – Yes ☐ No ☐ .

Approx. time spent during startup procedure _____ Hrs.

Did you advice customer on operation and maintenance of machine? Yes ☐ No ☐ .

Application and installation comments:

_____

Machine Sold By(Company) _____ Sales Person _____

Startup performed by _____ Date _____

THERE IS NO WARRANTY WITHOUT THIS REPORT!

Warranty Claim Report

Please complete the following claim form, your claim will be confirmed by our sales representative.

To : Coaire, Division of Quietside
8750 Pioneer Blvd., Santa Fe Springs, CA 90670
Tel(562)576-1330.Fax(562)699-4351 email: support@coaire.com

Distributor	Company	
	Address	
Customer	Company	
	Address	

Date	
Model	
Serial No.	
Run Hours	**Hrs.**
Setting Press.	**PSIG**

OPERATING CONDITIONS

Percent(%) on load	%	Ambient Temperature	·F
No. of days of operation weekly	Days	Discharge temperature	·F
Hours per day	Hours	Compressor area temperature	·F
Machine setting OL/OL or Mod		Environment [1)]	

1) 1 to 10, 1 being clean, 10 very dirty

Incoming Voltages			Full load amperage at _____ PSIG			Unload amperage at _____ PSIG		
L1 - L2	L2 - L3	L1 - L3	L1 - L2	L2 - L3	L1 - L3	L1 - L2	L2 - L3	L1 - L3
Volts	Volts	Volts	Amp.	Amp.	Amp.	Amp.	Amp.	Amp.

Symptom

Fault Diagnosis

Resolution

Parts required **Labor Cost**

No.	Item Number	Description/MFGR Part Number	Quantity	Labor Time: Hrs x $/Hrs= $
01				Travel Time: Hrs x $/Hrs= $
02				Total Amount:
03				
04				Technician's name:

WRITTEN BY _____ SIGNATURE X _____

QUALITY AND RELIABILITY WITHOUT COMPROMISE

COAIRE reserves the right to make changes, at any time without notice as a result of our commitment to continuous improvement.